

A BARRIER FOR AUSTRALIA'S CLIMATE COMMITMENTS? LAW, THE ELECTRICITY MARKET AND TRANSITIONING THE STATIONARY ELECTRICITY SECTOR

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I INTRODUCTION

This article questions the ability of current market frameworks to instigate large-scale, long-term systemic change to generation and network patterns in Australia. Systemic change will need to take account of the legal frameworks of the National Electricity Market ('NEM') – a market purposefully designed to deliver electricity to Australian households and industry in an economically efficient and reliable way. Not only is the current market framework in Australia perpetuating carbon-intensive patterns of electricity generation,¹ its legal frameworks are designed and embedded in a way that makes change cumbersome and difficult to achieve. This article will not only set out how the legal frameworks of the NEM can hinder systemic change, but will draw on a comparative case study example – the German electricity market reform experience – to flag the breadth and depth of market reform necessary for the transition to renewable energy.

Australia faces major challenges in addressing the fossil fuel dependence of its electricity system. Renewable energy – electricity generated from a variety of renewable sources² – is an important component of the transition to a low-carbon

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1 It was shown as early as 2000 that the introduction of a competitive electricity market resulted in a shift towards an increasing reliance on coal and consequently to a rise in emissions: Clive Hamilton and Richard Denniss, 'Generating Emissions? The Impact of Microeconomic Reform on the Electricity Industry' (2001) 20 *Economic Papers* 15, 20–1.

2 This article uses the term, 'renewable energy' synonymously with 'electricity generated from renewable sources'. It follows the definition of eligible renewable energy sources in s 17(1) of the *Renewable Energy (Electricity) Act 2000* (Cth) which includes hydro; wave; tide; ocean; wind; solar; geothermal-aquifer; hot dry rock; energy crops; waste; agricultural waste; waste from processing of agricultural products; food waste; food processing waste; bagasse; black liquor; biomass-based components of municipal solid waste; landfill gas; sewage gas and biomass-based components of sewage; and any other energy source prescribed by the regulations.

society that will be necessary in dealing with climate change. Greenhouse gas emissions from the stationary energy sector³ are a major contributor to human-induced climate change.⁴ Australia continues to rely on fossil fuels, especially hard coal and lignite, to provide for the bulk of its electricity needs.⁵ As a result, emissions from the electricity sector are the single most important source of greenhouse gas emissions.⁶

Several studies have shown that an electricity generation profile based on 100 per cent renewable energy is now technically possible.⁷ Yet, even though Australia has world-class renewable energy resources,⁸ a large-scale conversion to predominantly renewably generated electricity has remained elusive.

Australia has now committed to the Paris Process,⁹ which will require a regular revisiting and strengthening of climate change mitigation commitments.¹⁰ Australia is committed to 'implement an economy-wide target to reduce greenhouse gas emissions by 26 to 28 per cent below 2005 levels by 2030'.¹¹ The decarbonisation of the sector through transition to predominantly renewable sources of electricity will therefore need to be at the centre of Australia's climate change mitigation effort.

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- 3 The energy sector also includes transport and fugitive emissions. The stationary energy sector comprises electricity generation and direct combustion subsectors. For definitions, see Department of Climate Change and Energy Efficiency (Cth), 'Stationary Energy Emissions Projections' (Report, October 2012) 1.
 - 4 There is now scientific consensus that anthropogenic greenhouse gas emissions are a major contributor to a changing climate: see, eg, Thomas F Stocker et al (eds), *Climate Change 2013: The Physical Science Basis – Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge University Press, 2013); Katherine Richardson et al, 'Climate Change: Global Risks, Challenges and Decisions' (Synthesis Report, University of Copenhagen, 2009) 8–10.
 - 5 According to the Office of the Chief Economist, 'Energy in Australia 2015' (Report, Department of Industry, Innovation and Science (Cth), January 2016) 39, in 2013–14, lignite and hard coal-fired power stations provided 61 per cent of Australia's electricity, while gas-fired stations generated 22 per cent.
 - 6 Worldwide, 25 per cent of greenhouse gas emissions are from electricity and heat production, see Ottmar Edenhofer et al, *Climate Change 2014: Mitigation of Climate Change – Working Group III Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge University Press, 2014) 7. In Australia, electricity generation provided for 35 per cent of greenhouse gas emissions in 2015: see Department of the Environment (Cth), 'Australia's National Greenhouse Accounts – Quarterly Update of Australia's National Greenhouse Gas Inventory: December 2015' (Report, May 2016) 9.
 - 7 See, eg, Matthew Wright and Patrick Hears, 'Australian Sustainable Energy: Zero Carbon Australia Stationary Energy Plan' (Report, Melbourne Energy Institute and Beyond Zero Emissions, August 2011); Australian Energy Market Operator, '100 Per Cent Renewables Study – Modelling Outcomes' (Report, July 2013).
 - 8 See Department of Resources, Energy and Tourism (Cth), 'Energy White Paper 2012: Australia's Energy Transition' (October 2012) 13.
 - 9 Conference of the Parties, *Report of the Conference of the Parties on Its Twenty-First Session, Held in Paris from 30 November to 13 December*, UN Doc FCCC/CP/2015/10/Add.1 (29 January 2016) ('Paris Agreement').
 - 10 For the five-year review and strengthening mechanism of the nationally determined contributions of the parties of the *Paris Agreement*, see *ibid* annex art 4.
 - 11 Government of Australia, 'Australia's Intended Nationally Determined Contribution to a New Climate Change Agreement', Submission to the United Nations Framework Convention on Climate Change, August 2015.

Different countries have adopted a range of approaches to encourage the uptake of renewable energy. In Australia, this has involved specific laws grafted onto an existing regulatory framework that provides for a liberalised electricity market. These measures include the Renewable Energy Target Scheme ('RET'), legislated through the *Renewable Energy (Electricity) Act 2000 (Cth)* and further Acts and regulations.¹² The RET aims to achieve 20 per cent of Australia's electricity generation from renewable energy by 2020.¹³ State-based feed-in-tariff schemes,¹⁴ now mostly closed to new applicants, have also helped to lift the deployment of renewable energy in the Australia. Between 2001, when the RET was first introduced, and 2012, the renewable energy capacity in Australia almost doubled.¹⁵ The main legal instrument aimed at decarbonising the electricity sector, the now repealed Carbon Pricing Mechanism, only supported the deployment of renewable energy indirectly, by putting 'a price on greenhouse gas emissions in a way that encourages ... investment in clean energy'.¹⁶ In place of the Carbon Pricing Mechanism, Parliament enacted legislation to implement a 'Direct Action' policy based on paying for lowest cost abatement from a range of mitigation activities.¹⁷ The legislation makes no reference to renewable energy or addressing the stationary energy sector emissions. All of these legal instruments are held to be expressly external to the electricity market.¹⁸ They can provide an additional source of income to renewable generators, and generate demand for renewable energy.

However, it is the legal and regulatory frameworks of the NEM, embodied mainly in the *National Electricity Law* ('NEL')¹⁹ and the *National Electricity Rules* ('NER'),²⁰ which determine questions of access to the market, network development and network planning, which will be crucial to achieving a high

12 *Renewable Energy (Electricity) (Large-scale Generation Shortfall Charge) Act 2000 (Cth)*; *Renewable Energy (Electricity) (Small-scale Technology Shortfall Charge) Act 2010 (Cth)*; *Renewable Energy (Electricity) Regulations 2001 (Cth)*; Office of the Renewable Energy Regulator (Cth), *Determination of the Method to Be Used to Determine the Number of Certificates That May Be Created for a Particular Model of Solar Water Heater*, 8 March 2012; *Renewable Energy (Electricity) Amendment (Transitional Provision) Regulations 2010 (Cth)*; *Renewable Energy (Electricity) Amendment (Transitional Provisions) Regulations 2009 (Cth)*; *Renewable Energy (Electricity) Amendment (Solar Zones and Other Measures) Regulations 2014 (Cth)*.

13 Expressed as a numerical target of 33 850GWh: see *Renewable Energy (Electricity) Act 2000 (Cth)* s 40.

14 Feed-in-tariff schemes provide for guaranteed return for electricity fed into the network. In Australia they are limited to small-scale generation installations and have been cut back severely in the recent years. For Victoria, see, eg, *Electricity Industry Act 2000 (Vic)* ss 40F – 40NC.

15 Climate Change Authority (Cth), 'Renewable Energy Target Review' (Report, December 2014) 9 [2.2.1].

16 *Clean Energy Act 2011 (Cth)* s 3(d)(i), as repealed by *Clean Energy Legislation (Carbon Tax Repeal) Act 2014 (Cth)* sch 1 pt 1 item 1.

17 *Carbon Farming Initiative Amendment Act 2014 (Cth)*, amending *Carbon Credits (Carbon Farming Initiative) Act 2011 (Cth)*.

18 See, eg, Department of Resources, Energy and Tourism (Cth), above n 8, which holds that environmental policy issues 'are best dealt with outside the market settings through direct and targeted policy, as this allows for properly targeted, efficient and effective outcomes': at 112.

19 Contained in the *NEL* which is a schedule to *National Electricity (South Australia) Act 1996 (SA)*, which has been adopted through implementing legislation in Victoria, Queensland, NSW, SA and the ACT; explained in more detail below at Part II(B).

20 Australian Energy Market Commission, *National Electricity Rules*, Version 83, 29 September 2016.

percentage of renewable energy in the wholesale electricity market. Yet, this is an area of law that has received little attention in Australian legal literature.

The existing legal research on the role of law in facilitating renewable energy uptake in Australia focuses largely on describing or critiquing existing measures such as the RET.²¹ A body of international literature focuses on instrument design, for example, comparing feed-in-tariffs with target schemes.²² Instrument interaction, for example of emissions trading schemes and renewable energy deployment laws, provides a further focus of existing research.²³ Some of this literature is purely descriptive of the existing instruments.²⁴ There is also a smaller body of research dealing with planning law issues, such as the siting of specific renewable energy projects including wind farms.²⁵ However, little legal research has been directed to questioning the role of law in the electricity market frameworks and its ability to support or hinder renewable energy integration.²⁶ Wright has provided a snapshot of some key issues that need to be addressed through electricity market reform in order to transition to a low-carbon future, including potential reform to support demand-side participation, supporting small-scale distributed renewables and the unsuccessful reform to support renewable-friendly and scale-efficient network extensions.²⁷ There has also been some engagement of legal scholars in Australia with the question of whether

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- 21 Greg Buckman and Mark Diesendorf, 'Design Limitations in Australian Renewable Electricity Policies' (2010) 38 *Energy Policy* 3365; Scott Valentine, 'Braking Wind in Australia: A Critical Evaluation of the Renewable Energy Target' (2010) 38 *Energy Policy* 3668; Geoff Kelly, 'Renewable Energy Strategies in England, Australia and New Zealand' (2007) 38 *Geoforum* 326.
 - 22 There is also a large body of international literature on comparing different support instruments for renewable energy. For many others, see, eg, Volkmar Lauber (ed), *Switching to Renewable Power: A Framework for the 21st Century* (Earthscan, 2005); Anne Held, Mario Ragwitz and Reinhard Haas, 'On the Success of Policy Strategies for the Promotion of Electricity from Renewable Energy Sources in the EU' (2006) 17 *Energy and Environment* 849; Marc Ringel, 'Fostering the Use of Renewable Energies in the European Union: The Race between Feed-In Tariffs and Green Certificates' (2006) 31 *Renewable Energy* 1.
 - 23 See James Prest, 'A Dangerous Obsession with Least Cost? Climate Change, Renewable Energy Law and Emissions Trading' in Wayne Gumley and Trevor Daya-Winterbottom (eds), *Climate Change Law: Comparative, Contractual & Regulatory Considerations* (Lawbook, 2009) 179, 202–3.
 - 24 See, eg, Rosemary Lyster, 'The Australian Carbon Emissions Reduction Scheme: What Role for Supplementary Emissions Reduction Regulatory Measures?' (Legal Studies Research Paper 10/12, Sydney Law School, January 2010); Adrian Bradbrook and Alexandra Wawryk, 'Government Initiatives Promoting Renewable Energy in Electricity Generation in Australia' (2005) 25 *University of New South Wales Law Journal* 124.
 - 25 See, eg, Lisa Caripis and Anne Kallies, "'Planning Away" Victoria's Renewable Energy Future? Resolving the Tension between the Local and Global in Windfarm Developments' (2012) 29 *Environmental and Planning Law Journal* 415; Richard Hindmarsh and Catherine Matthews, 'Deliberative Speak at the Turbine Face: Community Engagement, Wind Farms, and Renewable Energy Transitions, in Australia' (2008) 10 *Journal of Environmental Policy & Planning* 217.
 - 26 The problem of adapting transmission investment and planning in particular to renewable energy was pointed out by several commentators from other disciplines, see, eg, Iain MacGill, Hugh Outhred and Karel Nolles, 'Some Design Lessons from Market-Based Greenhouse Gas Regulation in the Restructured Australian Electricity Industry' (2006) 34 *Energy Policy* 11.
 - 27 Glen Wright, 'The National Electricity Market and the Environment: Are We Heading in the Right Direction?' (2011) 4 *National Environmental Law Review* 43.

sustainability objectives should become part of regulatory decision-making,²⁸ which will be further discussed in Part V(B). The impact of reforms delegating technology choice and network planning to network and generation businesses and the implications for the legal and regulatory framework, however, have been less of a focus. Nonetheless issues of access to networks, and thus to the market, and the relative disadvantage of renewable energy under the current legal frameworks, are of clear policy significance in Australia.²⁹ Such factors were key issues identified by government consultants³⁰ and parliamentary committees,³¹ as well as non-government organisations.³² There is also a growing body of international scholarship questioning the ability of liberalised electricity markets to promote renewable energy³³ or transitions more generally.³⁴ Such studies usually build on countries' experiences of attempting to substantially increase generation of renewable energy.³⁵ This article seeks to address this gap in the literature and provide an introduction to some of the challenges and opportunities for renewable energy in the Australian NEM.

It is structured as follows: Part II will provide the backdrop for the discussion of the impact that legal and regulatory frameworks of the NEM have on renewable energy. It will set out the history of the NEM and locate its underlying ideology in economic concepts. It will conclude by shortly describing the resulting institutional framework of the NEM. In Part III, the article will explain the necessity of market reform for renewable energy by describing the difficulties renewable energy faces in the NEM. Part IV introduces the German electricity market reform experience to provide examples of legal reform expressly

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- 28 Rowena Cantley-Smith, 'A Changing Legal Environment for the National Electricity Market' in Wayne Gumley and Trevor Daya-Winterbottom (eds), *Climate Change Law: Comparative, Contractual and Regulatory Considerations* (Lawbook, 2009) 15, 26–7, 43; Rosemary Lyster and Adrian Bradbrook, *Energy Law and the Environment* (Cambridge University Press, 2006) 129. See also Environment and Natural Resources Committee, Parliament of Victoria, *Inquiry into the Approvals Process of Renewable Energy Projects in Victoria* (2010) 223; Wright, 'The National Electricity Market', above n 27, 44.
- 29 Some specific problems with electricity networks have been addressed elsewhere by the author, see Lee Godden and Anne Kallies, 'Electricity Market Developments: New Challenges for Australia' in Martha M Roggenkamp et al (eds), *Energy Networks and the Law: Innovative Solutions in Changing Markets* (Oxford University Press, 2012) 292; Anne Kallies, 'The Impact of Electricity Market Design on Access to the Grid and Transmission Planning for Renewable Energy: Can Overseas Examples Provide Guidance?' (2011) 2 *Renewable Energy Law and Policy Review* 147.
- 30 McLennan Magasanik Associates, 'An Initial Survey of Market Issues Arising from the Carbon Pollution Reduction Scheme and Renewable Energy Target' (Report to Australian Energy Market Commission, 16 December 2008). See especially 5–6.
- 31 Environment and Natural Resources Committee, above n 28.
- 32 See, eg, Gerard Drew, Beyond Zero Carbon, 'Zero Carbon Australia: Renewable Energy Superpower' (Report, October 2015); Glen Wright, 'Reforming the National Electricity Objective to Improve Environmental Outcomes in the National Electricity Market' (Discussion Paper, Total Environment Centre, March 2013).
- 33 Robert Gross and Philip Heptonstall, 'Liberalised Energy Markets: An Obstacle to Renewables?' in Ian Rutledge and Philip Wright (eds), *UK Energy Policy and the End of Market Fundamentalism* (Oxford University Press, 2010) 332.
- 34 Catherine Mitchell and Bridget Woodman, 'Regulation and Sustainable Energy Systems' in Robert Baldwin et al (eds), *The Oxford Handbook of Regulation* (Oxford University Press, 2010) 572.
- 35 See, eg, Malcolm Keay, John Rhys and David Robinson, 'Decarbonization of the Electricity Industry – Is There Still a Place for Markets?' (Report No EL 9, Oxford Institute for Energy Studies, November 2012).

employed to achieve an energy transition. In Part V, some legal barriers to electricity market reform in the Australian context are explained.

II THE AUSTRALIAN ELECTRICITY MARKET: THEORETICAL BASIS, DEVELOPMENT AND LEGAL REGIME

A Electricity Markets: Changing Regulatory Regimes and Theoretical Foundations

The legal frameworks underpinning electricity provision have undergone fundamental change in Australia and other comparable jurisdictions in Europe and North America, often based on neoliberal economic concepts.³⁶ While initially electricity was provided by integrated and typically state-based monopolies, in the 1980s and 1990s, market frameworks with competitive and regulated components became the leading governance model in Australia and elsewhere.³⁷ Significant changes to the institutional framework of electricity provision accompanied this development, with the aim of creating competitive national markets. Typical elements of electricity market reform include:³⁸

- *unbundling*, ie, the factual separation of the different functions of electricity provision, especially of generation and retail functions from the network functions, ie, transmission, distribution and retail;³⁹
- unbundling can be, but has not always been, accompanied by a move towards *corporatisation* and ultimately *privatisation* of electricity market segments, where they were state-owned initially;⁴⁰
- *third-party access*, ie, the opening of the grid to allow new competitors to participate in the energy market;

36 See, eg, David Driesen, 'Sustainable Development and Market Liberalism's Shotgun Wedding: Emissions Trading under the *Kyoto Protocol*' (2008) 83 *Indiana Law Journal* 21, 27.

37 Some degree of reform has been undertaken in almost all member states of the International Energy Agency. For an overview, see International Energy Agency, 'Energy Market Experience: Lessons from Liberalised Electricity Markets' (Report, Organisation for Economic Co-operation and Development, 2005). An overview of the worldwide reforms can also be found in the following PhD thesis: Erkan Erdogdu, *Essays on Electricity Market Reforms: A Cross-Country Applied Approach* (PhD thesis, University of Cambridge, 2013) 22–51 <http://mpr.aub.uni-muenchen.de/47139/1/MPRA_paper_47139.pdf>; as well as in Fereidoon P Sioshansi and Wolfgang Pfaffenberger (eds), *Electricity Market Reform: An International Perspective* (Elsevier, 2006). Well-established models include, the Scandinavian countries; the European Union member states of Germany, the United Kingdom, Ireland, Spain; and many markets in the United States, principally in Texas and the PJM Interconnection, which is a wholesale electricity market operated by a regional transmission organisation which is serving a large part of the eastern states of the United States. In South America, several countries, notably Chile, Peru and Colombia, have implemented liberal market models.

38 The following list has been compiled using Tooraj Jamasb and Michael Pollitt, 'Electricity Market Reform in the European Union: Review of Progress toward Liberalization & Integration' (2005) 26 *Energy Journal* 11, 13.

39 As state electricity commissions in Australia; in contrast in Germany many of the utilities were private or publicly owned.

40 See International Energy Agency, above n 37, 31; although privatisation has remained patchy.

- *competitive markets* introduced in the wholesale and generation sectors; and
- *incentive regulation*⁴¹ of transmission and distribution networks.⁴²

These specific developments in the electricity system can be seen as part of a larger movement towards reconsidering the role of the state in the provision of a range of essential services, be it water, health care, electricity or telecommunications.⁴³ Neoliberal ideas of ‘privatization, deregulation ... and a diminished public sphere’⁴⁴ have driven reform of essential services provision. Market frameworks for the electricity sector were introduced because private entities were expected to provide this public service more economically efficiently with competition as a driver.⁴⁵ While legal and regulatory frameworks continue to reflect the essential service nature of electricity provision through market objectives that demand safe, reliable and low-cost supply of electricity, allocative economic efficiency has become the guiding principle of the sector.⁴⁶

1 The Rise of the Regulatory State

In the neoliberal conception, the new role of the state is one of ‘steering’ rather than ‘rowing’.⁴⁷ This phrase neatly encapsulates the idea that policy decisions should be separate from service delivery.⁴⁸ While originally electricity supply was, in many cases, a direct state responsibility, now private actors dominate the sector. Their activities are bounded by a legal and regulatory framework that emphasises ‘government at a distance’.⁴⁹ ‘[T]he state is no longer seen as competent to directly provide certain public goods, yet it is still – as a “regulator” – responsible for their provision on a private basis’.⁵⁰ This shift from

41 As opposed to traditional cost-of-service or rate-of-return regulation. Incentive regulation relies on the regulator specifying a regulatory goal for the network operator, such as a certain degree of network reliability and an estimated budget to achieve this goal: see especially Productivity Commission, *Electricity Network Regulatory Frameworks*, Report No 69 (2013) vol 1, 93, 129.

42 Paul Joskow, ‘Electricity Sectors in Transition’ (1998) 19(2) *Energy Journal* 25.

43 For further reading, see Matthias Finger and Rolf W Künneke (eds), *International Handbook of Network Industries: The Liberalization of Infrastructure* (Edward Elgar, 2011); Christoph Hermann and Jörg Flecker (eds), *Privatization of Public Services: Impacts for Employment, Working Conditions, and Service Quality in Europe* (Routledge, 2012), which both provide multiple examples of liberalisation and privatisation in network industries, such as water, electricity, gas, telecommunications, rail and ports, as well as health care.

44 John Braithwaite, *Regulatory Capitalism: How It Works, Ideas for Making It Work Better* (Edward Elgar, 2008) 5.

45 International Energy Agency, above n 37, 15.

46 Ibid.

47 David Osborne and Ted Gaebler, *Reinventing Government: How the Entrepreneurial Spirit Is Transforming the Public Sector* (Plume, 1993) 25.

48 Ibid 35.

49 This term and that of ‘governing economic life at a distance’ was first used by Peter Miller and Nikolas Rose, ‘Governing Economic Life’ (1990) 19 *Economy and Society* 1, 9.

50 Burkard Eberlein and Edgar Grande, ‘Beyond Delegation: Transnational Regulatory Regimes and the EU Regulatory State’ (2005) 12 *Journal of European Public Policy* 89, 90.

a ‘provider’ to a ‘regulatory’ state⁵¹ can be clearly seen in electricity sector reform.

The ‘turn to markets’ for the more economically efficient provision of essential services has not led to a decreased role for law in the electricity system. Rather, such reforms have resulted in the proliferation of law and regulation, firstly, to set up the institutional structure of the market, and secondly, to ensure that these markets continue to fulfil their public tasks, for example, by imposing requirements for universal and economically efficient supply. The increase of regulation in the public services sector, even though seemingly at odds with the neoliberal agenda of a smaller rather than bigger role for the state, is a well-documented phenomenon.⁵² Thus, while in theory, electricity sector reform was driven by neoliberal ideas of a minimal state, in practice, it has been accompanied by increased regulation and a different, but arguably not lesser, role for the state.⁵³

2 Conceptualising Regulation in Market Frameworks

In its understanding of ‘regulation’, this article draws on the oft-cited definition from Braithwaite, who conceives regulation as a ‘large subset of governance that is about steering the flow of events, as opposed to providing and distributing’.⁵⁴

Electricity markets have been designed to take over the function of the state as the provider of electricity. Their legal and regulatory frameworks are therefore occupied with the creation of the market, the setting up of ‘a substructure of rules and other institutional and normative devices’, without which the market could not function.⁵⁵ These devices can be market-constitutive or concerned with ‘continuing policing’ of the market, to ensure a ‘level playing field’.⁵⁶ It is therefore possible to identify two different aspects of steering: ‘regulation of markets’ and ‘regulation through markets’.

Thus, and in a wider sense, the electricity market and its associated legal and regulatory frameworks become regulatory tools – the state steers electricity provision *through* the use of liberalised markets. While markets usually ‘are created by actors within the market’,⁵⁷ when created as a regulatory tool,

51 See, eg, Braithwaite, above n 44, 5–25; Michael Moran, ‘Understanding the Regulatory State’ (2002) 32 *British Journal of Political Science* 391; Jacint Jordana and David Levi-Faur, ‘The Politics of Regulation in the Age of Governance’ in Jacint Jordana and David Levi-Faur (eds), *The Politics of Regulation: Institutions and Regulatory Reforms for the Age of Governance* (Edward Elgar, 2004) 1, 8–11; Giandomenico Majone, ‘The Rise of the Regulatory State in Europe’ (1994) 17(3) *West European Politics* 77.

52 David Levi-Faur, ‘Foreword’ in John Braithwaite, *Regulatory Capitalism: How It Works, Ideas for Making It Work Better* (Edward Elgar, 2008) vii.

53 On the changed role of government in liberalised markets for electricity, see International Energy Agency, above n 37, 14–18.

54 Braithwaite, above n 44, 1.

55 Tony Prosser, ‘Theorising Utility Regulation’ (1999) 62 *Modern Law Review* 196, 197.

56 *Ibid.*

57 Wolfgang Pfaffenberger, ‘Preface: Competition and Long-Term Dimensions of Electricity Supply’ in Fereidoon P Sioshansi (ed), *Competitive Electricity Markets: Design, Implementation, Performance* (Elsevier, 2008) xxxv, xxxvi.

‘outsiders define and design the market and establish the rules and then the players function according to the rules laid out’.⁵⁸ Markets are now increasingly employed as regulatory tools in environmental and resource management law.⁵⁹ For example, both emissions trading schemes and renewable energy target schemes rely on created markets to achieve public interest outcomes. Similarly, the electricity market has been used as a regulatory tool to more efficiently provide an essential service – electricity.

In a narrower sense, legal and regulatory frameworks provide for the regulation of the electricity market – they are concerned with the ‘continuing policing’⁶⁰ and ongoing control of the market. They ensure that the electricity market achieves its purpose of safe, secure and universal supply. This includes the economic regulation of electricity network businesses to ensure that they do not abuse their monopoly position or price controls in the retail market.

3 *The Public–Private Divide and Markets as Regulatory Instruments*

Accepting that electricity markets constitute ‘regulation through markets’ has implications for ideas of separate public and private spheres, which have dominated economic and legal discourse.⁶¹ The move towards market mechanisms, rather than state provision of essential services, has been accompanied by a distinct shift of the boundaries between what is considered the public and the private. Conceptions based on economic theory draw a hard line between the public and the private realm. The division is one of ‘the market versus regulation’,⁶² with the market seen as being in the private sphere and regulation as part of the greatly diminished public sphere.

However, accepting that the market is an instrument of regulation cuts across this artificial public–private divide. As noted, electricity provision was initially considered to be a public exercise, mostly undertaken by state-owned utilities. The essential service character of electricity supply continues to live on in the regulatory frameworks of the electricity markets. Yet, post liberalisation of the electricity sector, it is mostly private actors, with private profit interests, operating across the industry. These actors, though, perform ‘public’ functions, such as ensuring reliable and universal supply of electricity. Large firms, which dominate the electricity sector, occupy a position between the public and the private: ‘[t]heir decisions on investment, employment, and output have important allocational and distributional implications which resonate in the “public” sphere’, they thus ‘carry out functions of an essentially public character’.⁶³ In particular, network businesses are continuing to provide the public functions of

58 Ibid.

59 See, eg, Lee Godden and Jacqueline Peel, *Environmental Law: Scientific, Policy and Regulatory Dimensions* (Oxford University Press, 2010) 184 ff.

60 Prosser, above n 55, 197.

61 See, eg, Lee Godden et al, ‘Law, Governance and Risk: Deconstructing the Public–Private Divide in Climate Change Adaptation’ (2013) 36 *University of New South Wales Law Journal* 224, 226 ff.

62 Stephen Littlechild, ‘Foreword: The Market versus Regulation’ in Fereidoon P Sioshansi and Wolfgang Pfaffenberger (eds), *Electricity Market Reform: An International Perspective* (Elsevier, 2006) xvii.

63 Bronwen Morgan and Karen Yeung, *An Introduction to Law and Regulation: Text and Materials* (Cambridge University Press, 2012) 62.

safe, secure and reliable electricity supply, and the regulatory regimes are designed to achieve these public policy goals through private actors. In sum, it can be argued that depicting the state as ‘the public’ versus the market as ‘the private’ is not valid in the electricity sector, with different hybrid forms of public and private being prevalent.⁶⁴

The contradiction between an ‘economics derived’ conception of the market as private and the reality of the market as not only being regulated but also itself constituting regulation and thus inherently straddling the public and the private sphere, is apparent in the Australian electricity market. The following section on the evolution of the NEM clearly will show how the theoretical ideas of the regulatory state have also influenced the development of the particular legal and regulatory frameworks of the Australian electricity market.

B The Australian NEM

In Australia, the NEM relies on a cooperative national arrangement under the auspices of the Council of Australian Governments (‘COAG’). The NEM encompasses the legal and regulatory frameworks creating and managing wholesale and retail electricity markets as well as regulating transmission and distribution networks.⁶⁵ It covers an interconnected electricity system stretching along the east coast of Australia, reaching from South Australia and Tasmania in the south to Queensland in the north.⁶⁶

Renewable generators above a certain size participate in the NEM as so-called semi-scheduled generators.⁶⁷ As a result, the regulatory frameworks of the NEM have a significant influence on successful introduction of renewables into the electricity system. As the Climate Change Authority found, ‘wholesale market rules can affect the way renewable energy competes with other forms of generation, while network regulation can influence the cost and availability of access for renewable generation connecting to the grid’.⁶⁸

64 For example, in some of the Australian states, network ownership has not been privatised: see Productivity Commission (Cth), above n 41, 93. One of the biggest German utilities, the Energie Baden-Württemberg AG has the Land Baden-Württemberg and a consortium of municipalities and regional authorities as its main shareholders. See also on hybrid markets: A F Correljé and L J de Vries, ‘Hybrid Electricity Markets: The Problem of Explaining Different Patterns of Restructuring’ in Fereidoon P Sioshansi (ed), *Competitive Electricity Markets: Design, Implementation and Performance* (Elsevier, 2008) 65.

65 The *NEL* is a schedule to the *National Electricity (South Australia) Act 1996* (SA) and is applicable in all states and territories participating in the NEM through enabling legislation. Specific market and network rules are contained in the *NER*, which is subordinate legislation made under the *NEL*.

66 The Western Australian and Northern Territory electricity systems are not part of the NEM. They remain physically separate and have their own regulatory arrangements. More detail can be found at the website of the Economic Regulation Authority (WA), *Electricity* (22 June 2016) <<https://www.erawa.com.au/electricity>>; Department of Treasury and Finance (NT), ‘Northern Territory Market Reform’ (Information Paper, February 2014).

67 See *NER* r 2.2.7. Small-scale distributed renewable generation, such as rooftop solar, has an indirect impact on the market by lowering demand.

68 Climate Change Authority (Cth), ‘Renewable Energy Target Review: Final Report’ (December 2012) 29.

1 Historical Background

Electrification in Australia started in the late 19th century with several electricity companies generating and distributing electricity on a small-scale in the capital cities.⁶⁹ Following consolidation into state-owned utilities after World War II, vertical integration and centralised planning and operation of electricity generation and supply was the preferred model for the electricity sector until market reform in the 1990s.

State-based monopolies, such as the State Electricity Commission of Victoria, 'operated discrete electricity supply regimes and were solely responsible for the generation, transmission and delivery of electricity to all end-users'.⁷⁰

With technical advances, local grid systems were increasingly integrated to statewide systems. Yet, for a long time, these systems remained physically separate and

[e]ach state governed its electricity industry exclusively according to its priorities, eg, promoting the use of state resources, creating employment within the state, ensuring complete independence from other states for meeting electricity needs of the state.⁷¹

Australia-wide regulation only became necessary once the separate state networks started to connect. The first regulation on an inter-state level was the legislation regarding the Snowy Mountains Scheme, the *Snowy Mountains Hydro-Electric Power Act 1949* (Cth).

Apart from this scheme, however, by the 1980s, the electricity industry in Australia still relied on separate state-owned and managed utilities. The infrastructure patterns based on connecting the large population centres with each of the states' resources still dominate today.⁷² This was accompanied by a governance framework unique to each state, with 'contrasting technical standards and benchmarks, voltage systems, structures and governance philosophies'.⁷³ The main reasons for this included the constitutional responsibility of the states for electricity,⁷⁴ which is also reflected in the later choice of a national cooperative, rather than federal scheme for the NEM.⁷⁵ Nevertheless, both the physical system, and consumer expectations of a safe, secure and reliable as well as affordable electricity supply, existed before market reforms, and continue in the current system.

69 Malcolm Abbott, 'The Performance of an Electricity Utility: The Case of the State Electricity Commission of Victoria, 1925–93' (2006) 46 *Australian Economic History Review* 23, 25; Deepak Sharma, 'The Multi-dimensionality of Electricity Reform – An Australian Perspective' (2003) 31 *Energy Policy* 1093, 1094.

70 Cantley-Smith, above n 28, 19.

71 Sharma, above n 69, 1094.

72 Thus, main transmission lines run, for example, from the hard coal-based generators in the Hunter Valley to Sydney; from the lignite-based generators in Latrobe Valley, Victoria to Melbourne and from the big hydroelectric schemes in Tasmania to Hobart: see map of infrastructure in Australian Energy Market Operator, 'An Introduction to the National Electricity Market' (Explanatory Document, July 2010) 25.

73 Sharma, above n 69, 1094.

74 Ibid.

75 Which, as will be seen, has proven to be remarkably resistant to change.

This centralised and integrated model of state-based provision of electricity was increasingly called into question in the 1980s. Inefficiencies expressed through overinvestment in ‘generating capacity, overstaffing, inflexible pricing and lack of accountability’⁷⁶ plagued the state-based model. Initially, attempts to make state-owned industries more economically efficient were made at state level.⁷⁷ These included corporatisation of public utilities to achieve greater economic efficiency and accountability, and, in some states, administrative separation of generation segments from transmission.⁷⁸ While considerable efficiency gains were made,⁷⁹ reforms did not address the basic integrated structure of the industry.⁸⁰

Starting in the early 1990s, a nationally based electricity system was developed and framed as part of a general move towards microeconomic reform. Microeconomic reform

is concerned with governments initiating change to institutional structures with the aim of improving the economic efficiency with which the resources available within the Australian economy (both fabricated and natural) are utilised so that the overall material well-being of the community is enhanced.⁸¹

Under the auspices of microeconomic reform, Australia saw widespread ‘deregulation’, which was characterised by reducing government intervention in private-sector markets, through measures such as cutting back tariffs and state assistance.⁸² The ideological background for these measures was firmly based on neoclassical economic theory and was modelled on the United Kingdom electricity market reforms of the 1980s.⁸³ The current market structure is the result of this national competition reform. It was designed ‘using the tools of microeconomics’.⁸⁴ The ensuing regulatory framework was superimposed on the existing generation and network infrastructure profile, which was at this time relying predominantly on fossil fuel sources. For infrastructure industries in general and the electricity industry in particular, path dependence and the resulting lock-in of unsustainable patterns of electricity generation is well described.⁸⁵ The market frameworks introduced to provide the same service more

76 Sharma, above n 69, 1094. See also William Tompson and Robert Price, ‘The Political Economy of Reform: Lessons from Pensions, Product Markets and Labour Markets in Ten OECD Countries (Organisation for Economic Co-operation and Development, 2009) 380.

77 Sharma, above n 69, 1095.

78 See, eg, Tompson and Price, above n 76, 380.

79 Sharma, above n 69 1095–6.

80 See Tompson and Price, above n 76, 381.

81 John Kain, ‘National Competition Policy: Overview and Assessment’ (Research Paper No 1, Parliamentary Library, Parliament of Australia, 1994) 2 (citations omitted).

82 See generally, John Quiggin, *Great Expectations: Microeconomic Reform and Australia* (Allen & Unwin, 1996); John Quiggin, ‘Economic Governance and Microeconomic Reform’ (Paper presented at Conference in Economic Governance, Brisbane, 2001) 6–7 <<http://www.uq.edu.au/economics/johnquiggin/Conference/EconGovernance01.pdf>>.

83 John Quiggin, ‘Market-Oriented Reform in the Australian Electricity Industry’ (Research Paper, Australian Research Council, 15 March 2001) 2–3.

84 Stephen King, ‘Using Microeconomics to Protect Competition’ (2010) 43 *Australian Economic Review* 217, 223.

85 See, eg, the seminal work by Gregory C Unruh, ‘Understanding Carbon Lock-In’ (2000) 28 *Energy Policy* 817; or more recently Frank Geels, ‘Regime Resistance against Low Carbon Energy Transitions:

efficiently, participate in this lock-in and are therefore inherently biased towards fossil fuel-based, centralised electricity generation.⁸⁶

Reforms in line with the standard elements of electricity market reform⁸⁷ were recommended first by the Industry Commission in 1991⁸⁸ and then further developed at the Special Premiers' Conference in the same year. The conference determined that a National Grid Management Council was to be established, 'to encourage and co-ordinate the most efficient, economic and environmentally-sound⁸⁹ development of the electricity industry in eastern and southern Australia' in order to '[advance] co-operation in the electricity industry, the absence of which has cost the nation dearly in terms of excessive generation capacity, inappropriate plant mix and inflexibility of fuel use'.⁹⁰ In 1993, the subsequent *National Competition Policy Review*, also called *Hilmer Review* after its chairman, recommended the introduction of a market framework to supply electricity more economically efficiently.⁹¹

While national competition policy was crucial for developing the current regulatory framework, state-level industry restructuring continued to occur in parallel.⁹² State-level restructuring reforms to prepare for a national electricity market were agreed to in COAG meetings in 1993 and 1994.⁹³ These included the agreements on:

- structural separation of generation, transmission, distribution and systems operation;
- the ability for customers to choose their supplier;
- non-discriminatory access to the interconnected transmission and distribution networks;
- non-discriminatory entry for new generators or retailers; and

Introducing Politics and Power in the Multi-level Perspective' (2014) 31(5) *Theory, Culture & Society* 21; Pablo del Río and Gregory Unruh, 'Overcoming the Lock-Out of Renewable Energy Technologies in Spain: The Cases of Wind and Solar Electricity' (2007) 11 *Renewable and Sustainable Energy Reviews* 1489.

86 Mitchell and Woodman, above n 34, 582–3.

87 Introduced above in Part II(A).

88 Industry Commission (Cth), *Energy Generation and Distribution*, Report No 11 (1991) vol 1.

89 This early commitment to 'environmentally-sound development' did not live on through further system evolution: Lyster and Bradbrook, above n 28, 128–9.

90 Special Premiers' Conference, 'Communiqué' (30 July 1991) 14–15.

91 Independent Committee of Inquiry, *National Competition Policy* (Australian Government Publishing Service, 1993).

92 Especially in Victoria, but also in NSW and SA, the former integrated state utilities were disaggregated and corporatised during the first half of the 1990s. Detailed accounts of the degrees of restructuring are available at Mike Roarty, 'Electricity Industry Restructuring: The State of Play' (Research Paper No 14, Parliamentary Library, Parliament of Australia, 1998); Ann Rann, 'Electricity Industry Restructuring – A Chronology' (Background Paper 21, Parliamentary Library, Parliament of Australia, 1998).

93 See Council of Australian Governments, 'Communiqué' (8–9 June 1993) <<https://pmtranscripts.dpmc.gov.au/sites/default/files/original/00008882.pdf>>; Council of Australian Governments, 'Communiqué' (25 February 1994) <<http://parlinfo.aph.gov.au/parlInfo/search/display/display.w3p;query=Id%3A%22media%2Fpressrel%2F1KC66%22>>; Council of Australian Governments, 'Communiqué' (19 August 1994) <<http://parlinfo.aph.gov.au/parlInfo/search/display/display.w3p;query=Id%3A%22media%2Fpressrel%2F3KC66%22>>.

- the abolition of legislative or regulatory barriers to interstate and/or intrastate trade.⁹⁴

Privatisation was not part of the reform requirements, and mixed forms of public and private network and generation operations continue to exist in the industry.⁹⁵

2 *A National Electricity Market Framework*

In 1996, the NEM framework was established. The main piece of legislation governing the NEM is the *NEL*.⁹⁶ The legal framework for the NEM is established through the *National Electricity (South Australia) Act 1996 (SA)*, which is valid in all states through the operation of enabling legislation.⁹⁷ Through this piece of legislation and delegated legislation, especially the *NER*,⁹⁸ all roles and responsibilities of market participants are defined. While generation and, increasingly, retail functions of the market have been opened to competition, the transmission and distribution components are maintained as regulated monopolies.

The move towards a single electricity system along the eastern seaboard of Australia was a gradual one. The enactment of national legislation signified the beginning of the institutional unification of the separate state systems. The current institutional framework was set up in response to an independent review of energy market directions.⁹⁹ This review, also called the *Parer Review*,¹⁰⁰ was finalised in 2002 and recommended a set of reforms especially in regard to the institutional design of the market. The reforms were especially targeted to reduce government influence on the market. Although the reforms provided for a clear policy oversight role for the government, they opposed government involvement on an operational level.¹⁰¹

Following this review, the COAG Ministerial Council on Energy provided a report to COAG in 2003, which contained recommendations to form two new statutory bodies, the Australian Energy Market Commission ('AEMC') and the Australian Energy Regulator ('AER') to replace the National Electricity Code Administrator.¹⁰² In 2004, the Australian Energy Market Agreement, agreed between all Australian governments, established the current institutional

94 Council of Australian Governments, 'Communiqué' (19 August 1994) attachment A.

95 For an overview of the different ownership structures in the Australian electricity industry, see Productivity Commission (Cth), above n 41, 93.

96 Contained in the schedule to the *National Electricity (South Australia) Act 1996 (SA)*.

97 *Electricity (National Scheme) Act 1997 (ACT)* s 5; *National Electricity (New South Wales) Act 1997 (NSW)* s 6; *Electricity – National Scheme (Queensland) Act 1997 (Qld)* s 6; *Electricity – National Scheme (Tasmania) Act 1999 (Tas)* s 6; *National Electricity (Victoria) Act 2005 (Vic)* s 6.

98 Australian Energy Market Commission, *National Electricity Rules*, Version 83, 29 September 2016.

99 Council of Australian Governments, 'Communiqué' (8 June 2001) <<http://parlinfo.aph.gov.au/parlInfo/search/display/display.w3p;query=Id%3A%22media%2Fpressrel%2F3KC66%22>>.

100 Council of Australian Governments, 'Towards a Truly National and Efficient Energy Market' (Energy Market Review, 20 December 2002).

101 *Ibid* 80.

102 Ministerial Council on Energy, 'Report to the Council of Australian Governments: Reform of Energy Markets' (Report, 11 December 2003).

framework of the electricity and also the gas market.¹⁰³ As a final change to the institutional framework, the National Electricity Market Management Co Ltd, the manager of the electricity market, was replaced by Australian Energy Market Operator ('AEMO') in 2009.¹⁰⁴ A raft of amendments to the existing legislation enabled the new framework.¹⁰⁵ Crucially, amendments introduced a new National Electricity Objective in section 7 of the *NEL*, which centred narrowly on efficiency concerns.¹⁰⁶

By the end of the 2000s, the different state systems were not only physically interconnected, but also covered by a unified legal framework, although state regulators retained some responsibilities.

3 *The Institutional Framework and the Objective of the NEM*

A range of institutional actors participate in the NEM. The legal framework prescribes clear tasks for all market participants¹⁰⁷ and institutions, with minimal overlap between functions and clear objectives for decision-making.¹⁰⁸

The following table¹⁰⁹ summarises the different institutions involved in the NEM and their functions:

103 Council of Australian Governments, 'Australian Electricity Market Agreement' (Intergovernmental Agreement, 9 December 2013).

104 See *National Electricity (South Australia) (National Electricity Law – Australian Energy Market Operator) Amendment Act 2009* (SA) pt 3, amending *NEL* pt 5.

105 *National Electricity (South Australia) (New National Electricity Law) Amendment Act 2004* (SA), amending *National Electricity (South Australia) Act 1996* (SA); *Australian Energy Market Commission (Establishment) Act 2005* (SA); *Trade Practices Amendment (Australian Energy Market) Act 2004* (Cth).

106 In more detail below at Part II(B)(3).

107 The market participants are the generators, transmission network service providers, distribution network service providers and the retail companies.

108 Craig Oakeshott, 'Appendix B. Case Study: Australia (High Wind Energy Penetration in South)' in Jaquelin Cochran et al, *Integrating Variable Renewable Energy in Electric Power Markets: Best Practices from International Experience* (United States Department of Energy, 2012) 39.

109 The table was adapted from the English draft version of Lisa Caripis and Lee Godden, 'Marcos legales y regulatorios para la transición hacia un sector eléctrico bajo en emisiones: Lecciones desde la experiencia australiana' [Legal and Regulatory Frameworks for a Transition to a Low Emissions Electricity Sector: Lessons from the Australian Experience] in Pilar Moraga (ed), *Energía, cambio climático y sustentabilidad: Una mirada desde el derecho* [Energy, Climate Change and Sustainability: A View from the Law] (Thomson Reuters, 2013) 193.

Institution	Function	Details
COAG Energy Council ¹¹⁰	Energy policy development	COAG Energy Council comprising all state, territory and federal energy and resources ministers. This council is the primary policy maker, ¹¹¹ responsible for oversight of the legislative and regulatory framework of the NEM. ¹¹² Has the power to issue statements of policy principles to the AEMC. ¹¹³
AEMC	Rule-making and market development	Statutory authority 'responsible for rule-making and energy market development at a national level ... including in respect of the <i>National Electricity Rules</i> '. ¹¹⁴ Conducts the rule making process, as well as energy market reviews for the COAG Energy Council and provides policy advice to the COAG Energy Council. ¹¹⁵ Must comply with statements of policy principles as far as consistent with statutory duties. ¹¹⁶
AEMO	Market operation; Network planning	Market operator that oversees and facilitates the wholesale market. It also has a national planning function, which includes preparing, maintaining, and publishing a National Transmission Network Development Plan. ¹¹⁷
AER ¹¹⁸	Economic regulation of networks; Market rule enforcement	Responsible for the economic regulation of the wholesale electricity market and transmission networks, and the enforcement of the <i>NEL</i> and the <i>NER</i> . ¹¹⁹ Functions include the determination of the revenues that the transmission and distribution network service providers receive for infrastructure augmentation and extension. ¹²⁰ Enforcement of the <i>NEL</i> and <i>NER</i> .

110 Since mid-2015; formerly the Ministerial Council for Electricity, then Standing Council for Energy Resources.

111 Council of Australian Governments, 'Australian Electricity Market Agreement', above n 103, cl 4.

112 Ibid recital A.

113 *NEL* s 8.

114 Council of Australian Governments, 'Australian Electricity Market Agreement', above n 103, cl 5.1. For further details on functions see *NEL* s 29; *Australian Energy Market Commission Establishment Act 2004* (SA).

115 Australian Energy Market Commission, *Who We Are* (2016) <<http://www.aemc.gov.au/about-us/who-we-are.html>>.

116 See *NEL* s 8.

117 See *National Electricity (South Australia) (National Electricity Law – Australian Energy Market Operator) Amendment Act 2009* (SA); *NEL* s 49(2).

118 Established as part of the Australian Competition and Consumer Commission under pt IIIAA of the *Trade Practices Act 1974* (Cth), now *Competition and Consumer Act 2010* (Cth).

119 *NEL* s 15.

120 *NEL* ss 2, 15; *NER* chs 6–6A.

Additionally, state institutions remain responsible for technical and safety licensing regimes¹²¹ and transmission reliability standards¹²² in the market. These standards differ from state to state.

In Australia, the market institutions were designed to provide for a clear 'arm's length' role for government. Their particular design – separating policy direction from rule-making, and rule-making from economic regulation – provides for this separation very effectively. The COAG Energy Council is responsible for policy development, AEMC for rule changes and AER for economic network regulation. The AEMC has reinforced the rationale for this split in regulatory responsibilities, claiming it provides for clear accountability and furthers the objectives of the electricity market institutions.¹²³ The government should be responsible for high-level policy, while regulators should narrowly focus on the economically efficient operation of the market. The integration of wider environmental policy and energy policy could be best achieved when 'decisions are taken in a transparent manner and after full consultation with all affected parties'.¹²⁴ A 2015 Review of the Governance Arrangements for Australian Energy Markets confirms the institutional structure of the market, but queried the lack of strategic direction provided by the COAG Energy Council in the energy policy development.¹²⁵

The National Electricity Objective¹²⁶ guides regulatory decision-making in the electricity market framework. The objective applies across a range of specific regulatory regimes engaging with the issues of grid access, augmentation and transmission planning.

The current National Electricity Objective states:

The objective of this Law is to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to –

- (a) price, quality, safety, reliability and security of supply of electricity; and
- (b) the reliability, safety and security of the national electricity system.¹²⁷

While retaining the traditional, public service objectives of reliability, safety and security of supply, economic efficiency concerns play an overarching role in

121 In most states, participants in the electricity industry require a licence issued by state regulators to operate: see *Electricity Act 1994* (Qld) ch 2; *Electricity Act 1996* (SA) s 15; *Electricity Supply Industry Act 1995* (Tas) pt 3; *Electricity Industry Act 2000* (Vic) pt 2 div 3. In NSW and the ACT, only electricity distribution companies and retailers require a licence: see *Utilities Act 2000* (ACT) pt 3; *Electricity Supply Act 1995* (NSW) s 14. Please note that these pieces of state legislation retain their own objectives, which may include 'sustainability' objectives. For example, the *Electricity Supply Act 1995* (NSW) s 3(a) provides for 'efficient and environmentally responsible production' of electricity, which has not had a big impact on generation profiles, given the limited reach of the Act following the introduction of the NEM.

122 See in detail Productivity Commission (Cth), above n 41, app F, 28.

123 Australian Energy Market Commission, 'Strategic Priorities for Energy Market Development 2013' (Report, 23 October 2013) 34–5.

124 Ibid 35.

125 Michael Vertigan, George Yarrow and Euan Morton, 'Review of the Governance Arrangements for Australian Energy Markets' (Final Report, Council of Australian Governments Energy Council, October 2015) 7.

126 *NEL* s 7.

127 Ibid.

the electricity objective. This narrow conception of the electricity market objective operates as a barrier to ‘green’ market reform which will be discussed in more detail below at Part V.

In summary, the process of introducing a national market for electricity has been largely independent from ‘green’ or sustainability issues, but instead has been based on economic efficiency concerns. The NEM is now characterised by a clear separation of non-market concerns from market concerns, both through its objectives and its institutional frameworks. This reflects a theoretical grounding in ideas of a very clear public–private divide, which sees ‘green’ issues as clearly separate to the market and best supported through separate instruments.¹²⁸ The NEM has served Australia well in providing reliable and relatively affordable electricity for the last 20 years. However, as the following Part III shows, the transition to an electricity system with a high or very high percentage of renewable energy requires changes that may not easily be achieved in the current market framework.

The following Part III and IV explain some of the challenges that renewable energy faces in the electricity market and how they have been addressed in a particular jurisdiction, Germany.

III CHALLENGES FOR RENEWABLE ENERGY IN THE NATIONAL ELECTRICITY MARKET

A Participation of Renewable Energy in the Wholesale Market

The wholesale electricity market of the NEM is an energy-only, pool market. That means that all electricity generated by registered generators has to be sold through a mandatory pool arrangement, managed and administered by AEMO.¹²⁹ Because of the limited interconnection between the former state systems, electricity is traded in five regions, which align largely with the state borders.¹³⁰ Generators have to submit the price at which they would like to sell their energy through the pool, and AEMO balances and dispatches these offers according to demand.¹³¹ A spot-price market, to which offers by generators can be submitted in five-minute intervals, determines the regional clearing price, which all generators that are scheduled in a region receive.¹³² Renewable energy generators participate in these markets.

Where investment for new generation capacity can be secured, renewable energy has been shown to compete successfully in the NEM, to put downward pressure on electricity wholesale prices, and through this, to impact on the

128 See, eg. Australian Energy Market Commission, ‘Review of Energy Market Frameworks in Light of Climate Change Policies’ (Final Report, 30 September 2009) 14.

129 *NER* r 3.2. See also, Australian Energy Market Operator, ‘An Introduction to the National Electricity Market’, above n 72, 4.

130 See a map of the regions, in Australian Energy Market Operator, ‘An Introduction to the National Electricity Market’, above n 72, 25.

131 *Ibid* 9.

132 *Ibid* 12.

profitability of existing generation.¹³³ Indeed, the high uptake of wind in South Australia, has been one of the main reasons for the closure of the last existing coal-fired power station.¹³⁴

However, a lack of investment security can hamper the ability of renewable generators to invest and therefore to participate in the wholesale market in the first place. The decision to invest in generation capacity requires a market price that can recover the costs for investment. Here, the RET provides an important source of additional income for a renewable generator.¹³⁵ It does this by creating demand through requiring retailers to source a set percentage of energy from renewable sources. However, both the wholesale market price and the RET price are volatile. Together with the intermittency of renewable energy generated from wind and solar, and no guaranteed dispatch of the power produced, this makes it difficult to forecast investment returns for renewable generators. In Australia, financing investment in new renewable generation therefore usually requires additional security.¹³⁶ This is provided by either having a degree of vertical integration, ie, retailers investing directly into renewable energy, or by underwriting investment in renewable generation through so-called power-purchase agreements.¹³⁷ Power-purchase agreements 'are contracts with an "off-taker", generally a retailer, to purchase the electricity generated for a period of time at a certain price'.¹³⁸ The opportunity for vertical integration has led to a dominance of the three big Australian generation and retail businesses in renewable generation investment.¹³⁹ Because these 'gentailers'¹⁴⁰ also invest in fossil fuel generation, they have limited interest in investment beyond that which is required by law, ie, the RET. Independent renewable generators, on the other hand have had difficulties securing investment.¹⁴¹

In contrast, in Germany, where a feed-in-tariff scheme provides for guaranteed dispatch and a guaranteed income for a long-term period, this investment risk is mitigated.¹⁴² However, a more pressing problem for a high renewable electricity sector in Australia is the limited suitability of the existing electricity network.

133 The so-called merit-order effect and the downward pressure it puts on electricity prices is a result of the fuel costs, or short-run marginal costs, of renewable energy: see Dylan McConnell and Mike Sandiford, 'Winds of Change: An Analysis of Recent Changes in the South Australian Electricity Market' (Report, Melbourne Energy Institute, August 2016) 22 ff, with further sources.

134 Ibid 24.

135 For detail on the RET scheme, see below Part III(B).

136 See Dylan McConnell, 'Not Dead Yet: Flagship "Collapse" Only Part of Australia's Solar Story', *The Conversation* (online), 10 February 2012 <<http://theconversation.edu.au/not-dead-yet-flagship-collapse-only-part-of-australias-solar-story-5288>>.

137 Environment and Resources Committee, Parliament of Queensland, *Growing Queensland's Renewable Energy Electricity Sector* (2011) 26.

138 See McConnell, above n 136.

139 These companies are EnergyAustralia, AGL Energy and Origin Energy: see, eg, Productivity Commission (Cth), above n 41, 93.

140 Ibid.

141 Ibid. Pacific Hydro, for example, formerly an independent power producer, has opened a retail arm in 2012 to circumvent the need for securing a power-purchase agreement, see, eg, Pacific Hydro, 'Retail Opens for Business' (Press Release, 17 September 2012).

142 See Part III(B)(2) below.

B Networks – A Physical Barrier

Network layout and network development are of crucial importance for renewable energy. Electricity is transported to its user via high voltage transmission lines, which ‘carry electricity long distances’, and distribution lines, which ‘carry low voltage electricity to consumers’.¹⁴³ Electricity supply that relies on these interlocking technologies is a technologically sophisticated undertaking. Electricity cannot be stored once it is dispatched into the grid.¹⁴⁴ It must be produced at the same time it is consumed.¹⁴⁵ This leads to a need to balance supply and demand constantly, as electricity lines can only carry a certain amount of electricity without getting damaged.¹⁴⁶ Electricity infrastructure involves a long-term investment with accordingly long-term ‘pay-back’ periods, as the costs of putting in place the necessary long-lasting infrastructure, such as generation facilities, and transmission and distribution lines, are high.¹⁴⁷ In particular, the crucial network development of transmission and distribution lines that connect generation and end users needs to be regulated in a way that responds to changes on the demand side, with new generation and network infrastructure being built to match this demand.¹⁴⁸ Intermittent renewable energy sources, such as wind and solar, pose considerable technical challenges to the ability of a centralised grid network to integrate them.¹⁴⁹ Managing the intermittency of renewable energy sources will therefore become an important task for the legal and regulatory frameworks for electricity supply.¹⁵⁰ Additionally, renewable energy resources are often located remote to the grid. Yet, legal frameworks for network investment in Australia do not easily support the connection and opening of these resources for exploitation.

As the author has described elsewhere,¹⁵¹ the legal and regulatory frameworks for the NEM provide substantial barriers to grid investment to enable access to renewable resources remote to the existing grid network, and more generally transmission planning to enable a high percentage of renewable energy in the electricity system. Barriers include the requirement for generators to invest in the network necessary to connect to the nearest connection point.¹⁵² Because of the enormous costs of network infrastructure, investment in new renewable

143 Australian Energy Market Operator, ‘An Introduction to the National Electricity Market’, above n 72, 3.

144 See, eg, Chris Harris, *Electricity Markets: Pricing, Structures and Economics* (John Wiley & Sons, 2006) 12.

145 *Ibid* 50.

146 *Ibid* 63–4. See also Jochen Markard and Bernhard Truffer, ‘Innovation Processes in Large Technical Systems: Market Liberalization as Driver for Radical Change?’ (2006) 35 *Research Policy* 609, 614.

147 For transmission network pricing, see, eg, the estimates in Wright and Hearps, above n 7, pt 6.

148 See, eg, Ignacio Pérez-Arriaga and Luis Olmos, ‘Compatibility of Investment Signals in Distribution, Transmission and Generation’ in François Lévêque (ed), *Competitive Electricity Markets and Sustainability* (Edward Elgar, 2006) 230.

149 The *National Electricity Rules* define a generator as intermittent if their ‘output is not readily predictable’: at ch 10 (definition of ‘intermittent’).

150 See, eg, Jenny Riesz, Joel Gilmore and Magnus Hindsberger, ‘Market Design for the Integration of Variable Generation’ in Fereidoon P Sioshansi (ed), *Evolution of Global Electricity Markets: New Paradigms, New Challenges, New Approaches* (Academic Press, 2013) 757.

151 Kallies, ‘The Impact of Electricity Market Design’, above n 29; Godden and Kallies, above n 29.

152 Oakeshott, above n 108, 39.

generation is therefore based on the location of the resource close to the existing grid, rather than the quality of the resource.¹⁵³ This prevents the exploitation of potentially excellent renewable resources remote to the grid. Additionally, strategic network investment, which could enable the connection of new resources, is undertaken by the network businesses.¹⁵⁴ These businesses make commercial decisions based on regulatory requirements to ensure reliable electricity supply. They are first and foremost guided by economic efficiency concerns as provided for in the regulatory framework.¹⁵⁵ Under these conditions, network investment to exploit new resources or to facilitate clusters of renewable installations, has not been forthcoming.¹⁵⁶ In contrast, Germany's *Renewable Energy Act* and the different network investment regulations provide special rules that favour network investment where it is undertaken to facilitate renewable energy connection, as well as priority connection of renewable resources.¹⁵⁷

Finally, strategic planning beyond state borders is not well facilitated in the NEM. While AEMO has a strategic planning role in regard to network planning, its plans are not binding for the network businesses.¹⁵⁸ As will be seen in Part IV, in Germany legal reform has now moved towards providing for this crucial whole-of-system network planning to facilitate renewable energy on a large scale.

While Australia has so far managed to facilitate renewable energy within the existing network layout, percentages overall remain low. While South Australia has recently closed its last coal-fired power station and fully supplies its electricity from renewable sources and gas, it does rely on Victorian coal power via two interconnectors to provide network stability and backup generation.¹⁵⁹ The German example shows that to transition to an electricity sector largely relying on renewable energy will require considerable re-regulation of market frameworks.

IV THE GERMAN ENERGY TRANSITION – ELECTRICITY MARKET REFORM FOR DECARBONISATION

Germany is something of a poster child of electricity system transformation. Despite traditionally having an electricity system relying almost entirely on fossil fuels and nuclear power for electricity generation,¹⁶⁰ starting with the

153 Kallies, 'The Impact of Electricity Market Design', above n 29, 152.

154 Godden and Kallies, above n 29, 300.

155 For a detailed description of network investment rules and regulations, see *ibid* 300–2.

156 *Ibid* 301–2.

157 See in more detail below at Part IV.

158 Godden and Kallies, above n 29, 302.

159 Roger Dargaville, 'South Australia Is Now Coal-Free, and Batteries Could Fill the Energy Gap', *The Conversation* (online), 13 May 2016 <<https://theconversation.com/south-australia-is-now-coal-free-and-batteries-could-fill-the-energy-gap-59164>>; McConnell and Sandiford, above n 133.

160 In the 1950s, coal provided almost 90 per cent of West Germany's energy: Eike Röhling and Jochen Mohnfeld, 'Energy Policy and the Energy Economy in FR Germany: An Overview' (1985) 13 *Energy Policy* 535, 536. Numbers for the unified Germany are available from 1990: see AG Energiebilanzen

implementation of the *Electricity Feed-In Act*¹⁶¹ in 1990, Germany has embarked on a remarkable transformation of its energy system. This transformation aims to achieve a generation profile that is, to a large degree, based on renewable energy. Like Australia, Germany's electricity industry is regulated through a liberalised and privatised electricity market. However, unlike Australia, renewable energy has informed market reform to a large degree. The need to integrate renewable energy into the electricity system has taken centre stage in the German electricity market's future development. Some key themes can be taken away from the German experience to inform future development of the Australian electricity market.

A A Convergence of Climate and Energy Objectives

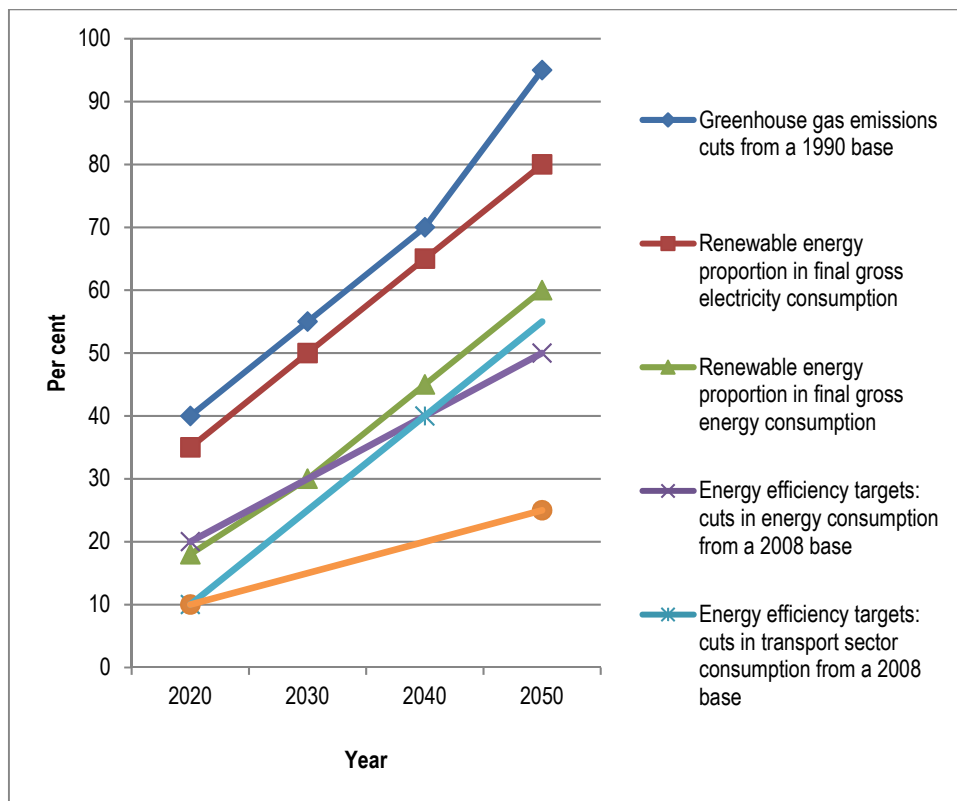
As a result of early commitment to environmental protection in Germany,¹⁶² energy policy became increasingly integrated with environmental policy. The first expressly integrated energy policy, addressing the connected challenges of energy and climate change, was adopted by the federal government in 2007 with the so-called Meseberg Program.¹⁶³ The *Energy Concept*¹⁶⁴ of the German federal government, adopted in September 2010, reflects the importance of environmental concerns for German energy policy. It sets out 'Germany's energy policy until 2050 and specifically lays down measures for the development of renewable energy sources, power grids and energy efficiency'.¹⁶⁵ The concept endorses a commitment to 'environmentally sound, reliable and affordable energy supply',¹⁶⁶ and clarifies the range of transformational change necessary to

[Working Group Energy Balances], 'Stromerzeugung nach Energieträgern 1990–2015' [Electricity Generation by Energy Source 1990–2015] (2 August 2016) showing the percentage of different energy sources in electricity generation mix since 1990. In 1990, hard coal and lignite generated 56.7 per cent of electricity, nuclear energy generated 27.7 per cent, whereas renewable energy provided only 3.6 per cent of electricity generation. In 2015, electricity generation from coal and nuclear sat at 42.3 and 14.2 per cent, respectively. Renewable energy generated 29 per cent of electricity in 2015.

- 161 *Gesetz über die Einspeisung von Strom aus erneuerbaren Energien in das öffentliche Netz (Stromeinspeisungsgesetz)* [Electricity Feed-In Act] (Germany), 7 December 1990, BGBl I, 1990, 2633.
- 162 See, eg, Frank N Laird and Christoph Stefes, 'The Diverging Paths of German and United States Policies for Renewable Energy: Sources of Difference' (2009) 37 *Energy Policy* 2619.
- 163 Bundesministerium für Umwelt, Naturschutz, und Reaktorsicherheit [Federal Ministry for the Environment, Nature Conservation and Nuclear Safety], 'The Integrated Energy and Climate Programme of the German Government' (Background Paper, December 2007) <http://www.bmub.bund.de/fileadmin/bmu-import/files/english/pdf/application/pdf/hintergrund_meseberg_en.pdf>.
- 164 Federal Ministry of Economics and Technology and Federal Ministry for the Environment, Nature Conversation and Nuclear Safety (Germany), 'Energy Concept for an Environmentally Sound, Reliable and Affordable Energy Supply' (Brochure, 28 September 2010) <<http://www.bmwi.de/English/Redaktion/Pdf/energy-concept,property=pdf,bereich=bmwi,sprache=en,rwb=true.pdf>>.
- 165 Federal Ministry for the Environment, Nature Conversation and Nuclear Safety, 'The Federal Government's Energy Concept of 2010 and the Transformation of the Energy System of 2011' (Media Release, October 2011).
- 166 Federal Ministry of Economics and Technology and Federal Ministry for the Environment, Nature Conversation and Nuclear Safety (Germany), above n 164, 3. Compare the aims of energy policy in the Department of Resources, Energy and Tourism (Cth), above n 8, xvii, which emphasises economic issues over environmental ones: 'building a secure, resilient and efficient energy system' that: 'provides accessible, reliable and competitively priced energy for all Australians', 'enhances Australia's domestic and export growth potential', and 'delivers clean and sustainable energy'.

achieve the envisioned energy turnaround. Ambitious energy and climate targets are the centrepiece of the concept. They are depicted in the following chart.

Figure 1: Germany's Climate and Energy Targets



What is especially significant, apart from the ambition of the targets¹⁶⁷ and the long-term vision they contain, is the breadth of the policy commitment, touching on energy efficiency, energy generation profile, as well as a greenhouse gas reduction commitment.

Legislating for the transformation of Germany's energy system gained further momentum with the Fukushima nuclear disaster which triggered a supplementary package of measures to speed up implementation. The *Atomic Energy Act*¹⁶⁸ was amended, to accelerate the phasing out of nuclear energy.¹⁶⁹

167 Which led commentators to say that Germany is undertaking a 'real-time experiment on itself without need', Hans Ulrich Buhl and Michael Weinhold, 'Editorial – The Energy Turnaround: A Real-Time Experiment Allowing No Failure or a Major Opportunity for Our Economy?' (2012) 4 *Business & Information Systems Engineering* 179, 180.

168 *Bekanntmachung de Neufassung des Atomgesetzes* [Atomic Energy Act] (Germany) 15 July 1985, BGBl I, 1985, 1565.

Further changes included amendments to the *Renewable Energy Act*,¹⁷⁰ changes to the *Energy Industry Act*¹⁷¹ and the implementation of the *Grid Extension Acceleration Act*.¹⁷² The package also contained an Act to establish an energy and climate fund,¹⁷³ as well as legislation changing the *Federal Building Code* in order to further allow onshore wind power development.¹⁷⁴ As a result, Germany's energy policy is now clearly targeted towards a changed generation profile based mainly on renewable energy sources.

A look at the objectives of the *Energy Industry Act* reveals that the new reality of increased amounts of renewable energy in the electricity sector is now well recognised. The objectives of the Act include the usual market objectives in § 1(2), which stipulates that:

The regulation of electricity and gas supply networks is to serve the goals of securing effective and undistorted competition in the supply of electricity and gas and of ensuring the long-term, effective and reliable operation of energy networks.

However, in paragraph 1, environmental compatibility and generation from renewable energy are emphasised. It states that:

The objective of this Act is to ensure the provision of, to the extent possible, cost-effective, consumer-friendly, efficient and environmentally compatible on-grid public supply of electricity and gas, which is increasingly generated from renewable energy sources (emphasis added).

The final part of the sentence was added in 2008, to ensure that electricity networks also allow for the increasing generation of energy from renewable energy sources.¹⁷⁵ Thus, it complements and deepens the commitment to support renewable energy network investment. It also reflects the increasing integration of market regulation with the more specific renewable energy regulation. These objectives have to be taken into account by all companies involved in the energy industry,¹⁷⁶ as well as the regulator, the Federal Network Agency.¹⁷⁷

169 *Dreizehtes Gesetz zur Änderung des Atomgesetzes* [Thirteenth Act Amending the Atomic Energy Act] (Germany) 31 July 2011, BGBl I, 2011, 1704.

170 *Gesetz für den Vorrang Erneuerbarer Energien* [Renewable Energy Act] (Germany) in art 1 of the *Gesetz zur Neuregelung des Rechts der Erneuerbaren Energien im Strombereich und zur Änderung damit zusammenhängender Vorschriften* [Act to Reform the Renewable Energy Law and to Amend Related Regulations] 25 October 2008, BGBl I, 2008, 2074 ('*Renewable Energy Act 2008*').

171 *Gesetz über die Elektrizitäts- und Gasversorgung* [Energy Industry Act] (Germany) in art 1 of the *Zweites Gesetz zur Neuregelung des Energiewirtschaftsrechts* [Second Act to Reform the Energy Industry Law] 7 July 2005, BGBl I, 2005, 1970, n 1 ('*Energy Industry Act*').

172 *Gesetz über Maßnahmen zur Beschleunigung des Netzausbaus Elektrizitätsnetze* [Grid Extension Acceleration Act] (Germany) 28 July 2011, BGBl I, 2011, 1690.

173 *Gesetz zur Änderung des Gesetzes zur Errichtung eines Sondervermögens „Energie- und Klimafonds“ (EKFG-ÄndG)* [Act Amending the Law Establishing an Investment Fund 'Energy and Climate Fund'] (Germany) 6 August 2011, BGBl I, 2011, 1702.

174 *Gesetz zur Förderung des Klimaschutzes bei der Entwicklung in den Städten und Gemeinden* [Act for the Strengthening of a Climate Conscious Development of Towns and Municipalities] (Germany) 30 July 2011, BGBl I, 2011, 1509.

175 See Explanatory Memorandum, *Gesetzes zur Neuregelung energiewirtschaftsrechtlicher Vorschriften* [Act Reforming the Energy Industry Act] 6 June 2011, BT Drs 17/6072, 2011, 50.

176 *Energy Industry Act* § 2.

177 See especially *Verordnung über den Zugang zu Elektrizitätsversorgungsnetzen (Stromnetzzugangsverordnung – StromNZV)* [Ordinance on Access to the Electricity Network] (Germany) 29 July 2005, BGBl I, 2005, 2243, § 30, enacted under *Energy Industry Act* § 24.

Further objectives and also legally binding targets are contained in the *Renewable Energy Act*. The *Renewable Energy Act* initially contained in § 1 the objective to 'facilitate a sustainable development of energy supply, particularly for the sake of protecting our climate and the environment' and to at least double the share of renewable energy in electricity supply by 2010. The objective was expanded in 2004¹⁷⁸ to include an express reference to renewable energy. The Act now aims 'to promote the further development of technologies for the generation of electricity from renewable energy sources'.

The *Renewable Energy Act* also contains in § 1(2) the renewable energy targets, which reflect the steadily increasing commitments by the federal government.¹⁷⁹ These legislated targets mirror the medium and long-term renewable energy targets in the *Energy Concept* of the German government.¹⁸⁰ The policy commitment of the German government to aggressively decarbonise the electricity system and support renewable energy is thus clearly reflected in the legal frameworks for the electricity market.

B Special Support for Renewable Energy

Germany's renewable energy regulation is generally considered a great success story, and a central factor in starting a successful transition to Germany's low-carbon energy future.¹⁸¹ While some commentators have criticised the high cost of this transition,¹⁸² others have pointed out that the wider economic benefits of the resulting 'rapid expansion of renewable energy' have so far outweighed the costs.¹⁸³

1 Supporting Renewable Energy in the Wholesale Market

In Australia renewable energy is traded within the general electricity market, with additional regulation to address price risks. The German feed-in-tariff

178 *Gesetz zur Neuregelung des Rechts der Erneuerbaren Energien im Strombereich* [Renewable Energy Act] (Germany) 21 July 2004, BGBl I, 2004, 1918 ('*Renewable Energy Act 2004*').

179 While the *Renewable Energy Act 2004* contained a commitment to a share of at least 12.5 per cent by 2010 and 20 per cent by 2020, in 2008 this was updated to a share of 30 per cent by 2020 though the *Gesetz zur Neuregelung des Rechts der Erneuerbaren Energien im Strombereich und zur Änderung damit zusammenhängender Vorschriften* [Act to Reform the Renewable Energy Law and to Amend Related Regulations] 25 October 2008, BGBl I, 2008, 2074.

180 The current version of the Act now commits in § 1(2) to 40–5 per cent by 2025, 55–60 per cent by 2035 and 80 per cent by 2050: see *Gesetz zur Neuregelung des Rechts der Erneuerbaren Energien im Strombereich (Erneuerbare-Energien-Gesetz – EEG 2014)* [Renewable Energy Act 2014] (Germany) in art 1 of the *Gesetz zur grundlegenden Reform des Erneuerbare-Energien-Gesetz und zur Änderung weiterer Bestimmungen des Energiewirtschaftsrechts* [Act For the Fundamental Reform of the Renewable Energy Law and to Amend Further Provisions of the Energy Industry Act] 21 July 2014, BGBl I, 2014, 1066 ('*Renewable Energy Act 2004*').

181 See Volker Oschmann, 'A Success Story – The German *Renewable Energy Act* Turns Ten' (2010) 1 *Renewable Energy Law and Policy Review* 45.

182 See, eg, Marcel Frondel et al, 'Economic Impacts from the Promotion of Renewable Energy Technologies: The German Experience' (2010) 38 *Energy Policy* 4048, 4053.

183 Oschmann, above n 181, 49. See also Umweltbundesamt [Federal Environment Agency], 'Stromerzeugung aus erneuerbaren Energien klimafreundlich und ökonomisch sinnvoll' [Renewable Electricity Generation: Climate-Friendly and Economically Sound] (Background Paper, April 2011).

scheme provided until recently a different approach. Until the introduction of limited wholesale market exposure in 2012, renewable energy did not compete with fossil fuel-generated electricity in the electricity market,¹⁸⁴ but generators were paid a fixed amount of money per kilowatt hours fed into the electricity grid. This has been identified as the main reason for the impressive rise of the percentage of renewable energy.¹⁸⁵ Germany is now gradually moving towards wholesale market exposure for renewable energy. While a direct marketing option was already introduced in 2008, it has now been made mandatory for all new renewable energy installations of a certain size.¹⁸⁶ Direct marketing requires renewable generators to sell the generated electricity directly in the wholesale market. They receive a market premium, which is used to ‘top-up’ the difference between the feed-in-tariff and the market price.¹⁸⁷ The 2014 changes also introduced the possibility to tender for solar photovoltaic installations.¹⁸⁸ Similar to the ACT renewable energy auction scheme,¹⁸⁹ these tenders determine the feed-in-tariff for a certain amount of solar photovoltaic installations in a competitive way. Their success means that they are now to be extended to wind energy.¹⁹⁰

Additionally, the *Renewable Energy Act* has always contained a priority dispatch rule for all renewable energy fed into the electricity grid.¹⁹¹ That means that renewable energy will always have to be dispatched first, thereby guaranteeing its sale. Together with the, often generous, tariffs, this has guaranteed a very positive investment climate for renewable energy. Investment security has been emphasised as one of the main reasons for feed-in-tariff schemes being more successful in supporting renewable energy uptake and ultimately cheaper than the green certificate schemes, such as the Australian Renewable Energy Target.¹⁹² However, recent reforms show that, as renewable energy technology matures, it is increasingly considered to be able to successfully participate in the wholesale market.

184 However, while not participating in the market, priority dispatch of renewably generated electricity enshrined in legislation ensures that renewably generated electricity diminishes the market power of the fossil fuel generators, because it will always have to be purchased prior to electricity generated from other sources.

185 From 3.6 per cent in 1998 to almost 30 per cent of electricity generation in 2015: Working Group Energy Balances, above n 160.

186 Initially this applied to all new installations bigger than 500kW installed capacity, and from 2016, also to those that have an installed capacity of bigger than 100kW; *Renewable Energy Act* §§ 2(2), 34, 37(2).

187 *Ibid* §§ 34–6, app 1.

188 *Renewable Energy Act* § 55.

189 Set up under *Electricity Feed-in (Large-scale Renewable Energy Generation) Act 2011* (ACT). For more detail, see Greg Buckman, Jon Sibley and Richard Bourne, ‘The Large-Scale SOLAR Feed-In Tariff Reverse Auction in the Australian Capital Territory, Australia’ (2014) 72 *Energy Policy* 14.

190 Federal Ministry for Economic Affairs and Energy (Germany), ‘The Energy Transition: Key Projects of the 18th Legislative Term (2nd Continuation of the 10-Point Energy Agenda of the Federal Ministry for Economic Affairs and Energy, January 2016)’ (Report, January 2016) 4.

191 Currently, *Renewable Energy Act* § 11(1).

192 For many others, see Held, Ragwits and Haas, above n 22.

2 Supporting Renewable Energy through Network Regulation

In Germany, network regulation for renewable energy is provided through a separate regime. Germany has extensively regulated in the area of network access and development. Unlike in Australia, where these issues are regulated under the auspices of general electricity market frameworks, Germany has introduced targeted, *lex specialis*, regulation for renewable energy. These separate legal provisions acknowledge that renewable energy has different requirements from conventional fossil fuel-based generation. This specialised regime has allowed Germany to address many of the regulatory barriers renewable energy faces in a liberalised electricity market structure. For example, unlike fossil fuel generators, which are connected to the network on a 'first come, first served' basis,¹⁹³ renewable energy generators have priority connection rights.¹⁹⁴ Network investment undertaken to facilitate renewable generations is approved by the regulator, the Federal Network Agency, where investments are 'necessary for the stability of the whole of the system, for the integration into the national or international grid system or for a needs-based development of the energy supply network according to § 11 of the *Energy Industry Act*'.¹⁹⁵ This is also considered to be the case for inter alia, 'the integration of installations which fall under the *Renewable Energy Act*'.¹⁹⁶ With the latter substantiation, the German legislature again reinforces the central importance of renewable energy in electricity supply. In Australia, by contrast, transmission network operators invest primarily to ensure system reliability, which has the effect of disadvantaging renewable energy.

C Planning for the Future

While the feed-in-tariff laws and the network access regime in Germany emphasise the support for the individual generator, there is also increasing focus on strategic, whole-of-system network planning to enable the targeted high uptake of renewable energy.

Several Acts seek to address the issue of timely and renewable-friendly network development.¹⁹⁷ These Acts generally target the simplification and

193 *Verordnung zur Regelung des Netzanschlusses von Anlagen zur Erzeugung von elektrischer Energie (Kraftwerks-Netzanschlussverordnung – KraftNAV)* [Ordinance for Network Access for Power Stations] (Germany) 26 June 2007, BGBl I, 2007, 1187, § 4(6).

194 *Renewable Energy Act* § 8(1).

195 In German: 'soweit diese Investitionen zur Stabilität des Gesamtsystems, für die Einbindung in das nationale oder internationale Verbundnetz oder für einen bedarfsgerechten Ausbau des Energieversorgungsnetzes nach § 11 des Energiewirtschaftsgesetzes notwendig sind'.

196 *Verordnung über die Anreizregulierung der Energieversorgungsnetze (Anreizregulierungsverordnung)* [Ordinance on Incentive-Based Regulation of the Power Grid] in art 1 of the *Verordnung zum Erlass und zur Änderung von Rechtsvorschriften auf dem Gebiet der Energieregulierung* [Ordinance for the Enactment and Amendment of Provisions in the Area of Energy Regulation] (Germany) 19 October 2007, BGBl I, 2007, 2529, § 23(1) para 2.

197 These include the *Gesetz zur Beschleunigung von Planungsverfahren für Infrastrukturvorhaben* [Infrastructure Planning Acceleration Act] (Germany) 9 December 2006, BGBl I, 2006, 2833; *Gesetz zum Ausbau von Energieleitungen (Energieleitungsausbaugesetz)* [Energy Network Extension Act] (Germany) in art 1 of the *Gesetz zur Beschleunigung des Ausbaus der Höchstspannungsnetze* [Act to Accelerate the Development of High-Voltage Grids] (Germany) 21 August 2009, BGBl I, 2009, 2879;

acceleration of network planning. A new strategic network planning regime was introduced in 2011 with the §§ 12(a)–(e) of the *Energy Industry Act*.¹⁹⁸

Prior to these changes, network planning was the responsibility of the individual network operators, and based on business-level efficiency considerations.¹⁹⁹ The new framework has introduced a national, macro-economic focus, with considerable new powers for the regulator.²⁰⁰ The need to plan and build networks with a focus beyond the state (in German – *Länder*) level has been a main driver for the reform. Indeed, this focus on infrastructure has, according to Kühne, now replaced third party access as the main priority of energy policy.²⁰¹

Indeed, the reform of market rules and network regulation is an ongoing process and at the core of the current reform agenda for the German energy transition.²⁰² Key projects include legal reform of electricity market design, transmission and distribution network regulation.

In contrast, Australian network planning is contained within the reach of each of the separate network businesses, which continue to operate within each of the states. In summary, Germany has successfully linked its high-level policy commitments all the way down to the level of generation and network investment.

V THE LEGAL BARRIERS TO ELECTRICITY MARKET REFORM IN AUSTRALIA

It is acknowledged that the current political climate is not conducive to promotion of electricity market reform to decarbonise Australia's electricity system. The federal government has shown a high willingness to roll back support for not only renewable energy, but also for climate mitigation measures more generally. However, as the world has agreed on new and binding commitments for climate mitigation with the *Paris Agreement*,²⁰³ the challenge of decarbonising the Australian electricity system will resurface, even if the current political climate is not favourable.

Gesetz über Maßnahmen zur Beschleunigung des Netzausbaus Elektrizitätsnetze [Grid Extension Acceleration Act] (Germany) 28 July 2011, BGBl I, 2011, 1690.

198 Through the *Gesetz zur Neuregelung energiewirtschaftsrechtlicher Vorschriften* [Act Reforming the Energy Industry Law] (Germany) 26 July 2011, BGBl I, 2011, 1554.

199 Christian Calliess and Miriam Dross, 'Neue Netze braucht das Land: Zur Neukonzeption von Energiewirtschaftsgesetz und Netzausbaubeschleunigungsgesetz (NABEG)' [The Country Needs New Networks: About the Reconceptions of the *Energy Industry Act* and the Grid Extension Acceleration Act] (2012) 20 *JuristenZeitung* 1002, 1003.

200 *Ibid.*

201 Gunther Kühne, 'Regulating the Extension of Electricity Networks: A German Perspective' in Martha M Roggenkamp et al (eds), *Energy Networks and the Law: Innovative Solutions in Changing Markets* (Oxford University Press, 2012) 371, 391–2.

202 Federal Ministry for Economic Affairs and Energy (Germany), above n 190.

203 *Paris Agreement*, UN Doc FCCC/CP/2015/10/Add.1.

Australia's Renewable Energy Target, if left unchanged, is on track to provide for at least 20 per cent²⁰⁴ of Australian electricity use to come from renewable energy generation by 2020. The target is not expressed as a percentage target in the legislation, but rather as a numerical target of 33 850 gigawatt hours from renewable sources.²⁰⁵ Until recently the numerical target was set at 41 000 gigawatt hours²⁰⁶ Because of falling electricity demand, this target was not considered to continue to represent a 'real 20 per cent',²⁰⁷ and was accordingly cut following the recommendations of an independent expert review, the Warburton Review.²⁰⁸ Yet, moving considerably beyond this 20 per cent provides the real challenge to the existing system and its market-based legal and regulatory frameworks. Both the federal government and the AEMC have consistently emphasised that the electricity market as such does not need to be adapted to support renewable energy. Given the evidence from Germany, which has reformed its market frameworks to support renewable energy, Australia needs to reconsider its approach.

There are uniquely Australian barriers for change in comparison to Germany. They combine to make the NEM particularly resistant to change. As will be detailed, integration of climate and energy market policy development is prevented on several interlinked levels. Not only is there no direct mechanism for government intervention linking federal climate change policy to national market development, but the institutional frameworks for the NEM have effectively removed electricity market legal frameworks from parliamentary scrutiny.

A Constitutional Constraints for Regulating Electricity Markets to Support Climate Commitments

Constitutional constraints are central to the ability to address national challenges, such as the transformation of the electricity system. They provide legislative power to different levels of government in a federal state. Constitutional constraints have crucially influenced the specific development of the electricity market in Australia, which has therefore been driven on a national, rather than a state or federal level.

Australia, like Germany, is a federal state. Six state governments and the federal government share responsibilities according to the *Australian Constitution*. Exclusive federal powers²⁰⁹ to legislate can be distinguished from concurrent or shared powers.²¹⁰ They are subject to section 109 of the *Constitution*, stating that where federal law is inconsistent with state law, federal

204 Possibly more because of declining electricity demand: see Mike Sandiford, 'Another Summer in the NEM', *The Conversation* (online), 17 March 2014 <<https://theconversation.com/another-summer-on-the-nem-24451>>.

205 *Renewable Energy (Electricity) Act 2000* (Cth) s 40.

206 Amended by *Renewable Energy (Electricity) Amendment Act 2015* (Cth).

207 Ian MacFarlane and Greg Hunt, 'Renewable Energy Target' (Joint Media Release, 22 October 2014).

208 Dick Warburton et al, 'Renewable Energy Target Scheme: Report of the Expert Panel' (Report, Commonwealth of Australia, August 2014).

209 Such as exclusive powers in regard to the seat of the federal government, defence or minting coins, see *Australian Constitution* ss 52, 90, 114, 115.

210 Listed in s 51 of the *Australian Constitution*.

law prevails.²¹¹ In principle, the states are responsible for all matters that are not enumerated as exclusively federal within the *Constitution*.²¹²

For historical reasons, there is no express federal power with respect to the environment, energy or climate change under the *Australian Constitution*. The federal government has so far relied on various heads of powers, such as trade and commerce, taxation, corporations and external affairs²¹³ to legislate in the area of environment, renewable energy and climate change. The federal government's power to legislate for corporations, as well as the trade and commerce power,²¹⁴ could arguably cover the field of electricity market legislation. This is supported by the High Court finding in *Commonwealth v Tasmania* ('*Tasmanian Dam Case*') as early as 1983, which found that a corporation developing a hydro-electricity scheme in the Franklin River was subject to these powers.²¹⁵ However, the current Australian National Electricity Market is based on a national cooperative arrangement, rather than a federal constitutional powers approach.

The preference for cooperative intergovernmental arrangements in many economic fields of regulation in Australia reflects the lack of a general economics clause in the concurrent powers in the *Constitution*.²¹⁶ As a potential proxy for such a power, the nationhood power, which extends to 'matters incidental to the execution of any power vested by this *Constitution* in the Parliament or in either House thereof, or in the Government of the Commonwealth, or in the Federal Judicature, or in any department or officer of the Commonwealth'²¹⁷ has been interpreted narrowly by the High Court.²¹⁸ It does not confer a general power over economic matters, even where this is in the national interest. Instead, an existing head of power needs to be found if federal legislation is to be introduced. In the words of Barwick CJ in the *AAP Case*,

no specific power over the economy is given to the Commonwealth. Such control as it exercises on that behalf must be effected by indirection through taxation, including customs and excise, banking, including the activities of the Reserve Bank and the budget, whether it be in surplus or in deficit. The national nature of the subject matter, the national economy, cannot bring it as a subject matter within Commonwealth power.²¹⁹

211 While not so far contentiously discussed in the area of renewable energy, there is complex case law that governs conflicts. Tests developed by the High Court of Australia apply to resolve potential conflicts between state and federal. For an overview, see George Williams, Sean Brennan and Andrew Lynch, *Blackshield and Williams Australian Constitutional Law and Theory: Commentary and Materials* (Federation Press, 6th ed, 2014) ch 8.

212 *Australian Constitution* s 107.

213 *Australian Constitution* ss 51(i)–(ii), (xx), (xxix). For a detailed discussion of the powers to regulate the environment see, eg, Jacqueline Peel and Lee Godden, 'Australian Environmental Management: A "Dams" Story' (2005) 28 *University of New South Wales Law Journal* 668.

214 *Australian Constitution* ss 51(xx), (i) respectively.

215 (1983) 158 CLR 1.

216 Cf Germany, *Grundgesetz für die Bundesrepublik Deutschland* [Basic Law of the Federal Republic of Germany] art 74(1) para 11, which puts 'the law relating to economic matters', including energy under concurrent legislation. This has allowed the introduction of federal law for the energy industry.

217 *Australian Constitution* s 51(xxxix).

218 *Victoria v Commonwealth* (1975) 134 CLR 338 ('*AAP Case*').

219 *Ibid* 362.

These limitations of the national development of the economy, have given rise to extensive cooperative arrangement in areas where the national interest needs to be achieved. COAG and under its apex, ministerial councils, provide the forum for the development of 'national' legislation outside the *Constitution*, a process that has been termed 'executive federalism'.²²⁰

The history of creating a national market for electricity in Australia is interwoven with the development of COAG as the forum for cooperative arrangements among governments in the national interest.²²¹ COAG was created in May 1992, following several Special Premiers' Conferences²²² initiated by Prime Minister Hawke, to address Australia's international competitiveness. Electricity market development featured as an early issue within these conferences and the current framework is based on such a cooperative national arrangement.

In Australia, the distribution of state and federal legislative powers hampers the development of a truly integrated energy policy. Different levels of government responsible for environmental issues on the one hand and energy markets on the other hand make it difficult to integrate these concerns. Thus, while there is legislation supporting renewable energy on both state and federal levels,²²³ energy market regulatory frameworks rely on a cooperative intergovernmental arrangement, which does not require a constitutional head of power. These arrangements perpetuate the insulation of energy market development from environmental and especially climate change concerns, through flow-on effects on institutional frameworks and regulatory objectives.

B The Lack of a 'Green' Market Objective

While widely phrased 'green' objectives may be difficult to enforce, they can support change in regulatory practice. Regulatory objectives can serve the important function of directing and orientating the regulatory framework towards a more sustainable, renewable-friendly regulatory framework.²²⁴

Several commentators have argued for the inclusion of an environmental objective in the National Electricity Objective.²²⁵ According to such arguments, this would allow for 'environmental sustainability to be addressed by the institutions governing the market, the national planning body, governments and market participants as a central aspect of their decision making'.²²⁶ In contrast to

220 See, eg, Cheryl Saunders, *The Constitution of Australia: A Contextual Analysis* (Hart Publishing, 2011) 250.

221 See Heads of Government, 'Communiqué' (11 May 1992) 2 <<https://pmtranscripts.dpmc.gov.au/sites/default/files/original/00008507.pdf>>.

222 In more detail, see Cheryl Saunders, 'Australian Economic Union' in Cheryl Saunders and Anne Mullins (eds), *Economic Union in Federal Systems* (Federation Press, 1994) 1, 2–4.

223 See the federal RET, and various feed-in-tariff schemes on the state level.

224 Aileen McHarg, 'Regulating for Sustainable Electricity Market Outcomes in Britain: Asking the Law Question' (2013) 30 *Environmental and Planning Law Journal* 289, 289.

225 Cantley-Smith, above n 28, 26–7, 43; Environment and Natural Resources Committee, above n 28, 223; Wright, 'The National Electricity Market', above n 27, 44; Wright, 'Reforming the National Electricity Objective', above n 32.

226 Environment and Natural Resources Committee, above n 28, 222.

Australia, in Germany, sustainability concerns have been integrated with other market objectives, which reflects the changing political attitude towards the purpose of the electricity market. The new challenges of climate change and the environmental destruction associated with fossil fuel-based generation have led to a rethink of further objectives of electricity supply, predominantly that of environmental sustainability.

The current lack of ‘green’ market objectives in the NEM creates a regulatory environment where decision-makers are not obligated to consider issues such as environmental sustainability. The lack of such an environmental objective has considerable impact on market development and reform through the market institutions, especially the COAG Energy Council, as will be seen in the next section, and the AEMC. Indeed, it is a recurrent theme in market reviews and rule changes that potential reforms are denied because they are not consistent with the market objective. For example, the AEMC considered the introduction of cost-sharing arrangements between generators and transmission network providers in order to facilitate transmission line extension into new resource areas.²²⁷ These arrangements had the potential to significantly address network investment challenges for renewable energy. Yet, the final rule determination only supported an information sharing scheme,²²⁸ which will not lead to greater investment in renewable friendly network extension. The AEMC refers expressly to the need to be consistent with National Electricity Objective as a reason for limiting the final solution for the rule change.²²⁹ The lack of a ‘green’ objective is not only preventing the AEMC from taking into account environmental concerns when considering rule changes, but is also limiting opportunities for policy development to support renewable energy as will be seen in the next section.

In Part II, it was explained that the NEM is in theory relying on an artificial divide of private and public concerns. In practice, however, the market has been introduced to achieve a public purpose – that of essential service provision. In Australia, as well as in Germany, the objectives of safe, secure and reliable supply and the protection of consumer interest continue to be reflected in law.²³⁰ Economic efficiency, as an additional norm, has been the central target of the liberalisation process, to be achieved through competitive wholesale and retail markets as well as by introducing economic efficiency into network regulation. Multiple objectives therefore are already a defining feature of electricity market legal frameworks. Understanding that contemporary electricity markets are not ‘real’ but hybrid markets,²³¹ already trying to bundle numerous objectives, helps

227 First considered in Australian Energy Market Commission, ‘Review of Energy Markets in Light of Climate Change Policies’ (Final Report, 30 September 2009) 11, followed by the Australian Energy Market Commission, ‘*National Electricity Amendment (Scale Efficient Network Extensions) Rule 2010*’ (Options Paper, 30 September 2010). A detailed discussion of this rule change can be found in Glen Wright, ‘Facilitating Efficient Augmentation of Transmission Networks to Connect Renewable Energy Generation: The Australian Experience’ (2012) 44 *Energy Policy* 79.

228 Australian Energy Market Commission, *National Electricity Amendment (Scale Efficient Network Extensions) Rule 2011*, 30 June 2011, i.

229 Ibid 26–7.

230 See *NEL* s 7; *Energy Industry Act* (Germany) § 1.

231 See discussion at Part II; Correljé and de Vries, above n 64.

to illuminate this aspect. Germany has introduced additional objectives for electricity market regulators that address sustainability concerns, and expressly recognise the need to acknowledge renewable energy in the electricity market.²³²

C Limited Avenues for Governmental Intervention

A final Australian barrier to market reform concerns the particular design of electricity market frameworks at 'arm's length' from the government. The lack of connection between electricity market development, and climate commitments becomes especially apparent now, with the federal government committing to an international climate mitigation process.

Introducing 'high-level policy' into the electricity market framework is complicated by its institutional design and the influence of the market objective on market reform. The COAG Energy Council, as a representative of state and federal governments, can guide market framework development by issuing statements of policy principle to the AEMC in regard to rule making or market reviews.²³³ However, the statements are self-limiting, because they have to be 'consistent with the national electricity objective'.²³⁴ The market objective, however, is defined narrowly around economic efficiency and reliability concerns.

Policy change to integrate environmental concerns with energy market policy therefore necessitates legal reform to change market objectives – a task that would require the concerted efforts of all governments, because of the particular institutional design of the legal framework for the Australian electricity market.

COAG arrangements require the coordination of all levels of government, state and federal, to initiate change. While the split of responsibilities between regulatory decision-making on the one hand, and policy development on the other hand, is clearly provided in law, the actual process of energy policymaking lacks transparency and parliamentary scrutiny.²³⁵ The positioning of energy market frameworks under a national regime ensured the centralised control over the electricity system, but hinders its acknowledgment of other concerns, such as renewable energy. Interlinking the two is complicated in the COAG framework, which disperses governmental responsibilities across a range of state and federal executive actors. In Germany, one level of government is responsible for climate mitigation and energy legislation.²³⁶ The state–federal split of energy and environmental responsibilities in Australia makes this integration more difficult.

232 The German *Energy Industry Act* §§ 1(1), 3 require 'environmentally compatible' supply of electricity, with renewable energy considered of special importance in this context.

233 *NEL* s 8.

234 *NEL* s 8.

235 This is a general problem with COAG decision-making, which has an in-built democratic deficit. For detail, see Paul Kildea and Andrew Lynch, 'Entrenching "Cooperative Federalism": Is It Time to Formalise COAG's Place in the Australian Federation' (2011) 39 *Federal Law Review* 103, 116–22.

236 Shared head of power for the economy, and specifically energy in Germany: *Grundgesetz für die Bundesrepublik Deutschland* [Basic Law of the Federal Republic of Germany] art 74(1) para 11; and for air pollution control, which covers climate mitigation: *Grundgesetz für die Bundesrepublik Deutschland* [Basic Law of the Federal Republic of Germany] art 74(1) para 24.

Australia's NEM is arguably particularly well insulated from change. Due to its reliance on an executive governance framework, there is no instrument for direct governmental influence on electricity market development. Instead, policymaking relies on an intergovernmental process, requiring all states and the federal government to agree on changes. While this has led to a high stability of electricity market legal frameworks, it is also very static and resistant to change.

VI CONCLUSION

With the recent commitment to the Paris Process, Australia will have to reconsider its legal mechanisms for climate mitigation. Currently, the Emissions Reduction Fund, which sits at the core of the Direct Action legislation,²³⁷ is expected to provide for the bulk of the reduction commitments together with the RET, with further policies to 'reduce emissions into the post-2020 period' to be developed over the next couple of years.²³⁸ Not only have these commitments already been criticised for falling short of the cuts needed to keep global temperatures below 2 degrees Celsius,²³⁹ but they do not address the question of electricity market reform at all. While legal instruments such as feed-in-tariffs, renewable energy target schemes or some method of pricing carbon are important for assuring the competitiveness of renewable energy generators in a liberalised wholesale electricity market, they cannot engender the urgent necessary and systemic change to the way Australia uses and produces electricity. This article demonstrates that a large-scale transition to renewable energy will require considerable electricity market reform. Fundamentally, energy transition towards a decarbonised electricity system requires not only a departure from the current path of fossil fuel-dependent electricity supply, but also the choice of a new path. The legal and regulatory framework of the Australian NEM, while successful in delivering electricity reliably and economically efficiently, is not designed to do so sustainably. What has become clear though, is that in order to address the difficulties renewable energy faces in a liberalised electricity market, Australia will have to overcome deeply ingrained ideas about the separation of the market as the private domain and climate policy as the public domain.

One possibility for overcoming the currently agreed-upon separation of electricity market frameworks from climate change concerns would be a concerted bottom-up push by the states and the Commonwealth through the COAG regime. Given the ongoing political influence of mining and incumbent electricity industry interests in state and federal politics,²⁴⁰ this option currently

237 *Carbon Farming Initiative Amendment Act 2014* (Cth).

238 Government of Australia, above n 11.

239 See, eg. Bernie Fraser, 'Some Observations on Australia's Post-2020 Emissions Reduction Target' (Statement by the Chair, Climate Change Authority (Cth), 14 August 2015) 3.

240 See, eg. Guy Pearse, *High & Dry: John Howard, Climate Change and the Selling of Australia's Future* (Viking, 2007); Darryn Snell, 'Phasing Out Coal Power Generation in Australia: Policies, Corporations and Unions' (2011) 22 *Labour & Industry* 143; David Marsh, Chris Lewis and Jenny Chesters, 'The Australian Mining Tax and the Political Power of Business' (2014) 49 *Australian Journal of Political Science* 711.

seems remote. Alternatively, a federal legislation to provide for a centralised management of electricity market development could be envisioned. This position is a theoretical possibility through the corporations power in the *Constitution*, but unlikely to be taken up given federal–state dynamics.²⁴¹ This would also require a federal government committed to decarbonising the electricity sector, which is currently not the case. However, a global push towards renewable energy,²⁴² together with continuing climate change impacts in Australia,²⁴³ may lead COAG and the federal government to reconsider their options in the longer term.

Ultimately, though, the choice of a new path for the electricity system is required. Because liberalised electricity markets inherently further the existing generation and network profile, choosing a new path is a process, which will require considerable ‘steering’ that the market institutions currently cannot provide. Germany has chosen to regulate for an energy transition based on large-scale investment in renewables and the associated infrastructure. These reforms do not change the basic objectives of the electricity system, but instead add an additional sustainability norm, which they seek to achieve through targeted regulation of renewables in their electricity systems.

Given the rise of storage technology, Australia, may, in the long term, seek to achieve a different electricity sector scenario, which relies on distributed renewable energy and storage opportunities to achieve decarbonisation. Research work into the particular barriers storage technology is facing in the NEM has already started.²⁴⁴ Whichever particular path of electricity sector development is ultimately chosen, this article provides a foundation for considering the areas of market reform that will be necessary to achieve systemic change. It has also demonstrated what barriers exist for market reform in the wider legal system.

Liberalised markets have, over the last several decades, been the preferred tool for delivering electricity reliably and efficiently in most developed countries. In Australia and elsewhere they have done so relying on fossil fuels. New challenges, such as climate change, now require a reconception of the way we use and produce energy. Understanding the opportunities and barriers the law

241 Cf the developments in water law. After an unsuccessful history of intergovernmental cooperation, the federal government legislated for a federal framework with the *Water Act 2007* (Cth). Section 9 of the Act lists the multiple heads of power that this legislation has relied upon. However, unlike in the electricity sector, there was high dissatisfaction with the former cooperative approach to water management. For details, see, eg, Daniel Connell, ‘The Murray-Darling Basin’ in Dustin Garrick et al (eds), *Federal Rivers: Managing Water in Multi-Layered Political Systems* (Edward Elgar, 2014) 309. In contrast, the highly institutionalised national solution for electricity market regulation is entrenched in a cooperative approach.

242 While specific agreements on renewable energy are few in international climate change law, (Steven Ferrey, ‘The Failure of International Global Warming Regulation to Promote Needed Renewable Energy’ (2010) 37 *Boston College Environmental Affairs Law Review* 67) some initiatives do exist, such as the International Conference for Renewable Energies, ‘Political Declaration’ (Declaration, 4 June 2004).

243 Commonwealth Scientific and Industrial Research Organisation and Australian Government Bureau of Meteorology, ‘State of the Climate 2014’ (Report, 2014).

244 Penelope Crossley, ‘Defining the Greatest Legal and Policy Obstacle to “Energy Storage”’ (2013) 4 *Renewable Energy Law and Policy Review* 268.

provides in this context will be crucial for a successful and sustainable electricity transition.